Transport Planning

2-6 Cavill Ave, Ashfield Proposed Mixed Use Development

Traffic and Parking Assessment Report

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Client: Shayher Alliance Pty Ltd

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1 Introduction

MLA Transport Planning (MLA) has been commissioned by Shayher Alliance Pty Ltd to prepare this traffic and parking assessment report to accompany a development application for a proposed mixed use development at 2-6 Cavill Avenue and 1-9 Thomas Street, Ashfield.

The proposed development involves the demolition of all existing buildings on the site and construct in their place four residential flat buildings with various heights. The proposed development would have a total of 264 residential apartments with one ground floor commercial tenancy (approximately 120m^2). The proposed development would be served by a two and a half level basement car park containing 320 car parking spaces with vehicular accesses provided off Thomas Street and Cavill Avenue.

This traffic report accompanies the development application to be lodged with Inner West Council seeking approval for the proposed development.

This report has been prepared to assess the traffic and parking implications of the proposed development. The report is set out as follows:

- Chapter 2 discusses the existing conditions including a description of the subject site
- Chapter 3 provides a summary of an approved planning proposal for the subject site
- Chapter 4 presents a brief description of the proposed development
- Chapter 5 assesses the proposed on-site parking provision and internal layout
- Chapter 6 examines the traffic generation and its effects, and
- Chapter 7 presents a summary and the conclusions of the assessment.

2 Existing Conditions

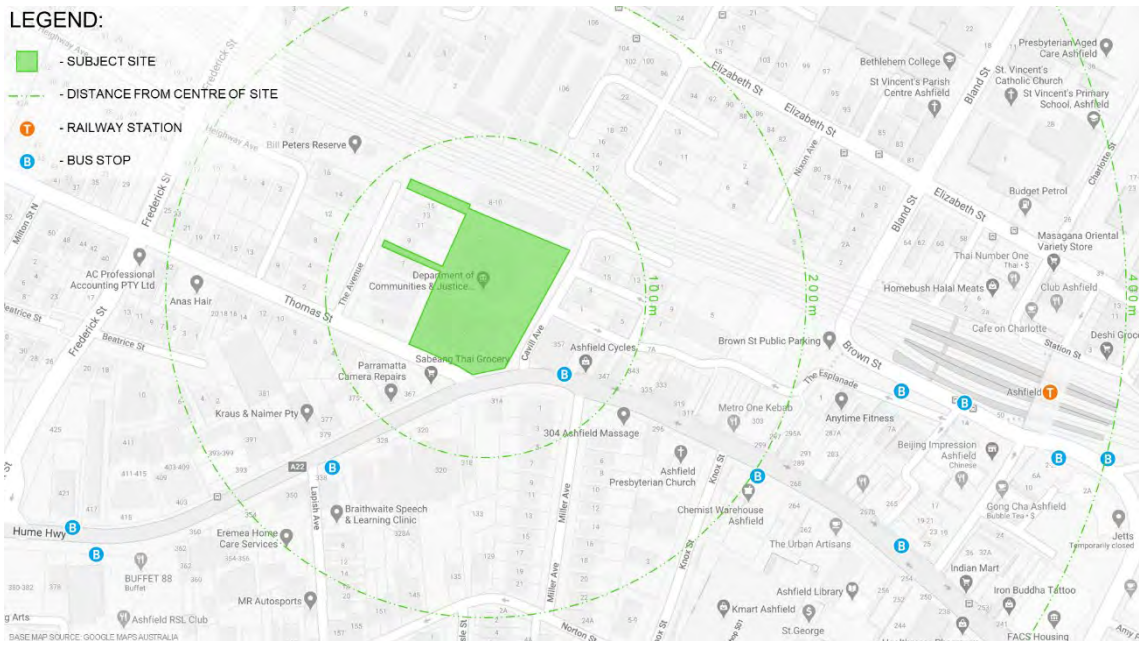
2.1 Site Description

The subject site is located at 2-6 Cavill Avenue and 1-9 and Thomas Street, Ashfield and falls within the Inner West Council local government area. It is legally described as Lot 1 in DP971932, Lot 1 in DP556722, Lot 1 in DP6262, Lot 2 in DP556722, Lot 2 in DP6262, Lot 5 in DP6262, Lot 9 in DP940918 and Lot 101 in DP234926. The overall site is generally rectangular in shape. The site is bound by Cavill Avenue to the east, Thomas Street to the south and established (medium and high density) residential dwellings to the west and north.

The subject site, being located within Ashfield Town Centre, has at its doorstop a plethora of services and amenities such as shops, medical facilities including dental surgeries and optometrists, restaurants, banks, entertainment and community services such as library. It is well located within walking distances to existing public transport nodes including bus stops in front of the site as well as Ashfield Railway Station within 450m walking distance or five-minute walk.

The location of the subject site and its surrounding environs are presented in Figure 2.1.

Figure 2.1: Site Locality Plan



The site is currently occupied by two commercial buildings with a total gross floor area of 10,600m^2 and is served by 279 on-site car parking spaces with vehicular accesses

located off Cavill Avenue, Thomas Street and The Avenue. The existing buildings are fully leased to the NSW Government until 2022.

2.2 Road Network

The road network in the vicinity of the subject site includes Liverpool Road, Thomas Street, Cavill Avenue and The Avenue. Below is a description of the local road network.

2.2.1 Liverpool Road

Liverpool Road is a declared State Road under the jurisdiction of Transport for New South Wales (TfNSW, formerly Roads and Maritime Services). It forms part of the arterial major road network linking Sydney's inner west suburbs with Sydney CBD.

In the vicinity of the site, Liverpool Road is generally aligned in an east-west direction and is configured as a four-lane, two-way road.

Clearway restrictions are in place from 6:00am to 10:00am in the eastbound carriageway (west of Thomas Street) and from 3:00pm to 7:00pm in westbound carriageway. In addition, "NO PARKING" restriction also applies in the eastbound carriageway from 3:00pm to 6:00pm with 1-hour parking permitted outside of this period.

Liverpool Road has a sign posted speed limit of 60km/hr.

2.2.2 Thomas Street

Thomas Street is regional road under the jurisdiction of Inner West Council. It is aligned in an east-west direction. It connects to Liverpool Road to the east and to The Strand and Paisley Road to the north providing access to Burwood Town Centre. It is generally configured with one traffic lane and one parking lane in each direction, however in front of the site kerbside parking is not permitted on either side of the road. Thomas Street has default speed limit of 50km/hr.

2.2.3 Cavill Avenue

Cavill Avenue is a local two-lane, two-way road under the administration of Inner West Council. It is aligned in a north-south direction between Liverpool Road and the railway line and re-aligns in an east-west direction approximately 40m north of Liverpool Road to connect to Markham Place. The north-south alignment of Cavill Avenue has one traffic lane with kerbside parking in each direction. The east-west alignment of Cavill Avenue is split in to two branches with each branch catering for one-way traffic flow only. Cavill Avenue is located within a 50km/hr speed limit area.

2.2.4 The Avenue

The Avenue is a local road with one traffic lane and one parking lane in each direction. It terminates near the railway line to form a cul-de-sac. It provides access to residential properties fronting it. Kerbside parking is available on both sides of the road. It has a default speed limit of 50km/hr.

2.3 Public Transport

As noted previously, the subject site is located in close proximity to Ashfield Railway Station and bus services along Liverpool Road. These public transport nodes provide good quality and frequent services to Sydney CBD and other major destinations across Sydney.

A review of public transport availability in the vicinity of the site is summarised in Table 2.1 for train services and in Table 2.2 for bus services.

Table 2.1: Available Train Services at Ashfield Railway Station

Line	Line Description	Weekday Peak Period No. of Services	Weekday Peak Period Frequency
T2 Inner West & Leppington Line	Parramatta/Leppington to City	62 (58)	5 mins (7 mins)

Note: Peak periods are from 6:30am to 9:30am in the morning and from 3:30pm to 6:30pm in the evening.

Table 2.2: Available Bus Services at the Subject Site

Route No.	Route Description	Weekday Peak Period No. of Services	Weekday Peak Period Frequency
418	Kingsford to Burwood via Mascot, Sydenham & Dulwich Hill	18 (17)	22 mins (19 mins)
464	Ashfield to Mortlake	32 (33)	14 mins (11 mins)
480	Central Pitt St to Strathfield via Homebush Rd	11 (14)	38 mins (22 mins)
483	Central Pitt St to Strathfield via South Strathfield	16 (16)	28 mins (20 mins)

Note: Peak periods are from 6:30am to 9:30am in the morning and from 3:30pm to 6:30pm in the evening.

Figure 2.2 shows a map of the existing available bus services in the vicinity of the subject site.

Figure 2.2: Bus Network

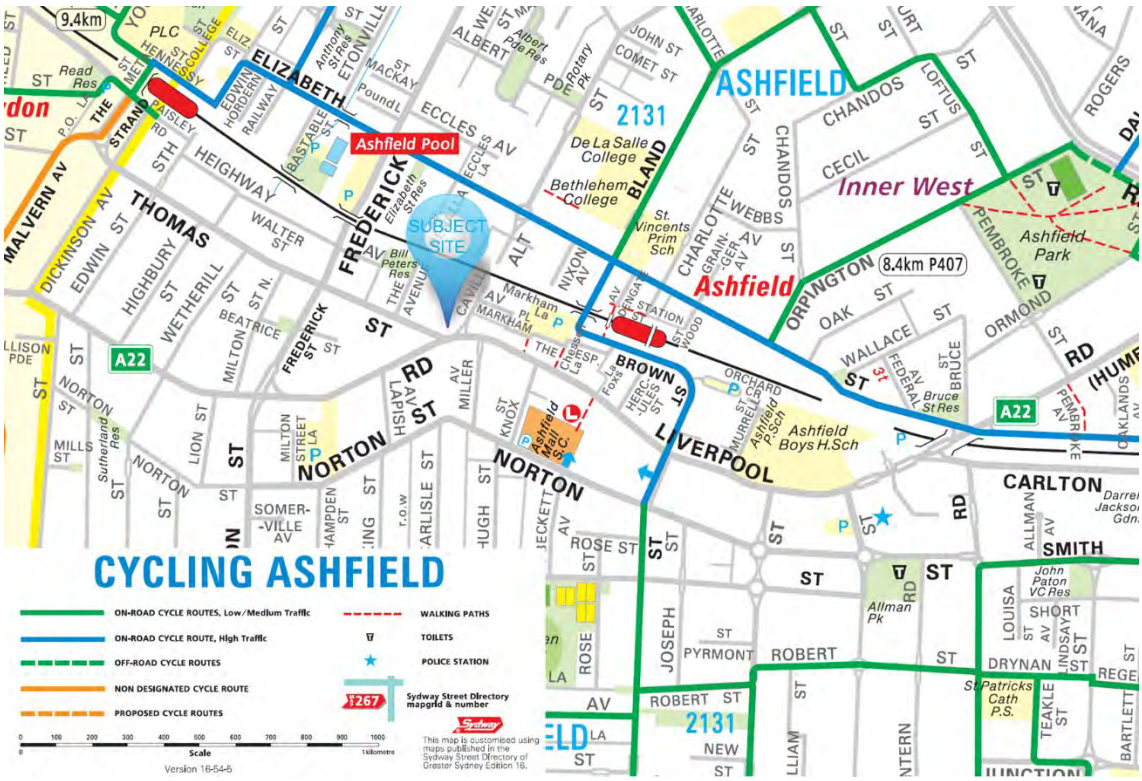
Source: TfNSW

2.4 Pedestrian and Cycle Network

At present, fully constructed pedestrian footpaths are available along either side of all roads in the nearby vicinity.

The available cycle routes in the vicinity of the site are shown in Figure 2.3.

Figure 2.3: Cycle Network



Source: https://www.innerwest.nsw.gov.au/explore/parks-sport-and-recreation/walking-and-cycling/walking-and-cycling-routes

3 Planning Proposal

The site was the subject of a planning proposal in July 2017. The planning proposal sought to amend the floor space ratio and building height controls. It has been endorsed by Inner West Council and granted gateway determination by the Greater Sydney Commission. The local environmental plan was subsequently amended in April 2019.

The planning proposal was accompanied by a traffic and parking assessment report. That traffic report assessed the traffic and parking effects of the planning proposal based on the following indicative development yield:

- 285 residential apartments comprising:
  - studio – 2 apartments
  - 1-bedroom – 113 apartments
  - 2-bedroom – 136 apartments
  - 3-bedroom – 34 apartments
- retail use – 1,500m^2.

The report assessed that the proposed development as envisaged in the planning proposal would require 395 car parking spaces based on the controls stipulated in the applicable development control plan at the time.

The report also estimated that the proposed development as envisaged in the planning proposal is expected to generate approximately 78 vehicle trips per peak hour during its busiest period. The report also indicates that the existing commercial use on the site generates 223 vehicle trips per peak hour. As such, the planning proposal would generate approximately 145 vehicle trips per peak hour less than the existing (commercial) use.

The report concluded that "*the proposed development is not expected to result in any significant impacts on the surrounding road network. Intersection improvements to nearby roads and intersections, therefore would not be required to accommodate the traffic demand from the proposed development*".

It is noted that the traffic engineering officer from Council did not raise any objections to the proposed development.

4 Development Description

4.1 Proposed Development

The proposed development involves the demolition of all existing buildings on site and construct in their place four residential flat buildings with a ground floor commercial use. Buildings A and D are proposed as 10-storey buildings, while Building B is proposed as a part 6, part 9-storey building and Building C as a 7-storey building. The locations of the proposed buildings are shown in Figure 4.1.

Figure 4.1: Building Locations

The proposed buildings will accommodate 264 residential apartments with the following apartment mix:

- 1-bedroom units – 76
- 2-bedroom units – 154, and
- 3-bedroom units – 34.

Table 4.1 provides a breakdown of the proposed apartment mix by building.

Table 4.1: Proposed Apartment Mix by Building

Building	1-Bedrrom Units	2-Bedrrom Units	3-Bedrrom Units	Total
Building A	22	60	16	98
Building B	5	19	9	33
Building C	21	27	0	48
Building D	28	48	9	85
Total	**76**	**154**	**34**	**264**

The proposed development also includes a single commercial/retail tenancy on the ground floor. The proposed commercial/retail tenancy has a floor area of approximately 120m^2.

It is noted that the proposed number of dwellings and the floor area of the retail tenancy in this DA scheme are less than that envisaged in the planning proposal.

The proposed development includes a two and a half basement level car park with 320 car parking spaces. The car park is proposed as a combined car park located beneath the proposed buildings.

The architectural car park plans are contained in Appendix A.

4.2 Proposed Access Arrangement

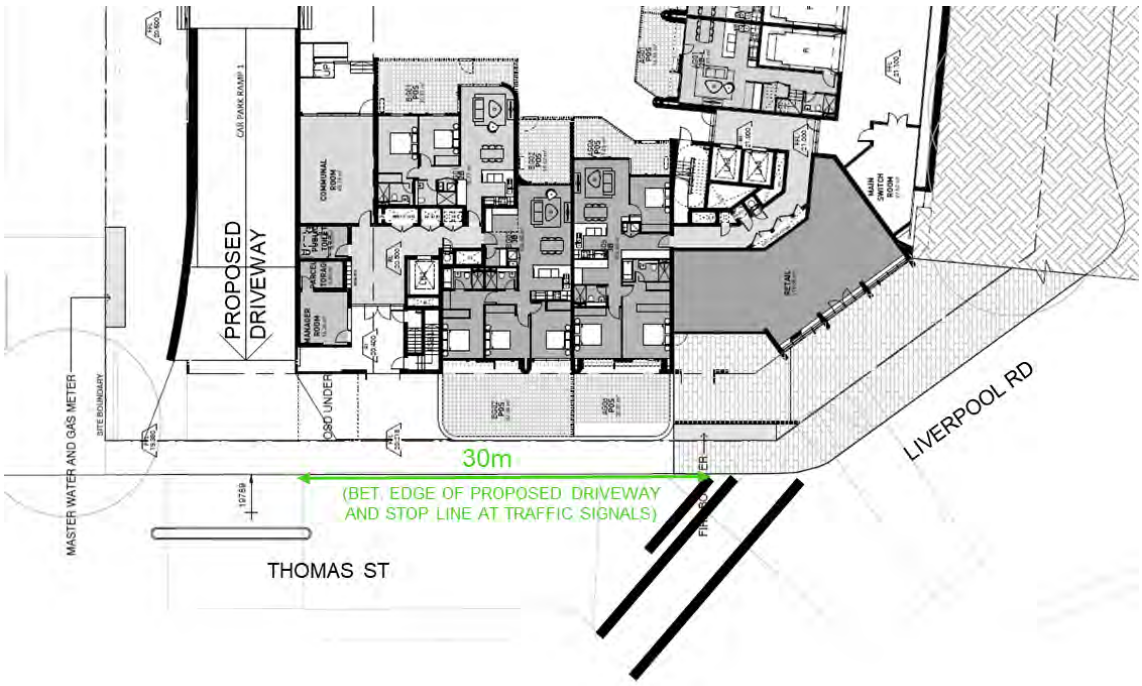
As noted previously, the existing development enjoys access from Thomas Street, Cavill Avenue as well as The Avenue. The existing Thomas Street and Cavill Avenue accesses are proposed to be retained, while the existing accesses on The Avenue are proposed to be removed.

These new accesses are proposed at generally the same locations as the existing driveways on Thomas Street and Cavill Avenue.

The Thomas Street access is proposed as the main driveway providing two-way access to and from the proposed development at all times for all traffic including service vehicles. In addition, the Thomas Street access is proposed to permit left-in and left-out traffic movements only to and from the proposed development. A median strip within Thomas Street in front of the proposed driveway is proposed to physically restrict vehicle movements.

As noted previously, the proposed Thomas Street access is located in the same location as the existing access which is approximately 30m away from the stop line on Thomas Street at its signalised intersection with Liverpool Road as shown in Figure 4.2.

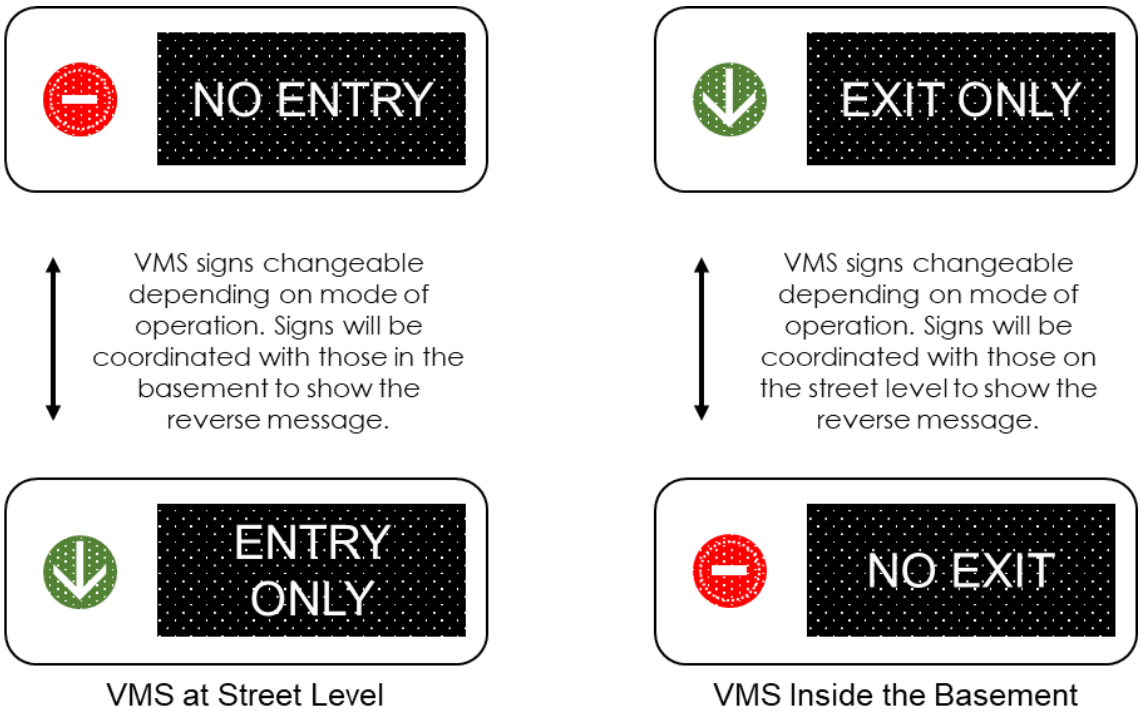
Figure 4.2: Location of Proposed Thomas St Access



The access off Cavill Avenue is proposed as a secondary access for residents only. It is proposed to configure the new Cavill Avenue as a single lane, one-way access for residents. In addition, it is proposed that the Cavill Avenue would operate exclusively as an egress during certain time of the day e.g. during weekday morning peak periods and exclusively as an ingress at other times e.g. weekday evening peak periods.

Variable message signs (VMS) are proposed at either end of the Cavill Avenue access ramp to inform residents the direction of traffic flow to ensure a safe and efficient operation of the access ramp. An example of the proposed VMS is presented in Figure 4.3.

Figure 4.3: Proposed Cavill Ave Access VMS



All redundant vehicle crossovers will be removed with kerb and gutter re-instated to Council's requirements and in accordance with relevant design guidelines.

4.3 Loading Facility

The proposed development includes an on-site loading bay on Basement Level B2. The proposed loading bay has been designed to accommodate service vehicles up to an Inner West Council's 10.4m waste collection vehicle.

The proposed loading bay will accommodate service vehicles for waste collection, removalist trucks and large bulky items deliveries (refrigerators, televisions, washing machines) etc.

It is proposed for service vehicles to share the same access as the general traffic accessing the car park from Thomas Street.

5 Parking Assessment

5.1 Car Parking Requirement

The car parking requirement for the proposed development has been assessed against Inner West Council's Comprehensive Development Control Plan 2016, specifically Part 8, Chapter A in Section 2 (DCP).

The parking assessment based on the DCP is presented in Table 5.1.

Table 5.1: DCP Car Parking Assessment

Proposed Land Use	No. of Dwellings/Floor Area	DCP Minimum Parking Rates	Minimum Car Parking Requirement
Residential Use			
- 1-Bedroom Dwellings	76 Apts	1.0 space per dwelling	76
- 2-Bedroom Dwellings	154 Apts	1.0 space per dwelling	154
- 3-Bedroom Dwellings	34 Apts	1.0 space per dwelling	34
- Visitors	-	1 space per 4 dwellings	66
Sub-Total	-	-	*330*
Non-Residential Use			
- Retail	120m^2	1.0 space per 40m^2	3
Sub-Total	-	-	*3*
Total	**-**	**-**	**333**

Based on the DCP requirements presented in Table 5.1, the proposed development is required to provide a minimum of 333 car parking spaces comprising:

- 264 resident parking spaces
- 66 visitor parking spaces, and
- 3 retail parking spaces.

Notwithstanding the above, it is noted that the Apartment Design Guide (ADG) also provides an alternative parking assessment for development sites located within 800m

of a railway station. The ADG makes recommendation based on provision of minimum off-street parking for residential developments. In this regard, Part 3J of the AGD states:

> *"For development... on sites that are within 800 metres of a railway station... the minimum car parking requirement for residents and visitors is set out in the Guide to Traffic Generating Developments, or the car parking requirement prescribed by the relevant council, whichever is less".*

Table 5.2 provides an assessment of the minimum recommended parking requirements based on the *Guide to Traffic Generating Developments*. It is noted that the ADG does not have any specific requirement for parking relating to non-residential uses. As such, parking requirements for residents and visitors are as set out in the *Guide to Traffic Generating Developments*, while parking for the retail use is as per requirement set out in the DCP.

Table 5.2: ADG Minimum Car Parking Requirements

Proposed Land Use	No. of Dwellings/Floor Area	ADG Parking Rates	ADG Minimum Parking Requirement
Residential Use			
- 1-Bedroom Dwellings	76 Apts	0.6 spaces per dwelling	46
- 2-Bedroom Dwellings	154 Apts	0.9 spaces per dwelling	139
- 3-Bedroom Dwellings	34 Apts	1.4 spaces per dwelling	48
- Visitors	-	1 space per 5 dwellings	53
Sub-Total	-	-	*286*
Non-Residential Use§			
- Retail	120m²	1.0 space per 40m²	3
Sub-Total	-	-	*3*
Total	**-**	**-**	**289**

§ The ADG does not stipulate parking requirements for non-residential uses. As such, the parking required for proposed retail use continues to be assessed based on DCP requirement.

Based on the above analysis, the ADG recommended minimum parking is 289 car parking spaces which is made up as follow:

- 233 resident parking spaces
- 53 visitor parking spaces, and
- 3 retail parking spaces.

From the above assessment, the DCP requires a total of 333 car parking spaces compares to an ADG requirement of 289 car parking spaces.

In addition, it is noted that SEPP 65 states that a development application cannot be refused on car parking grounds "*if the car parking for the building will be equal to, or greater than, the recommended minimum amount of car parking specified in Part 3J of the Apartment Design Guide*".

Therefore, as per SEPP 65 and Part 3J of the ADG, the parking requirement for the proposed development is a minimum of 289 car parking spaces.

5.2 Adequacy of Car Parking Spaces

It is proposed to provide a total of 320 car parking spaces comprising:

- 264 resident car parking spaces
- 53 visitor car parking spaces, and
- 3 retail car parking spaces.

Table 5.3 below compares the proposed parking provision with the requirements from the DCP and ADG.

Table 5.3: Proposed Parking Provision Comparison

Car Parking Types	DCP Requirements	ADG Minimum Parking Recommendation	Proposed Provision
Residents	264	233	264
Visitors	66	53	53
Retail	3	3	3
Total	**333**	**289**	**320**

The proposed car parking provision of 264 car parking spaces whilst it is higher than the ADG requirement, it complies with the DCP requirements. In this regard, it is noted that the ADG stipulates the minimum (with emphasis placed on the word "minimum") car parking for residential developments as being the lessor of the requirement from the *Guide to Traffic Generating Developments* and the DCP. Furthermore, SEPP 65 states that a development application cannot be refused on parking grounds if the proposed development proposes car parking equal to or greater than the recommended minimum parking from the ADG which in this case is 233 car parking spaces. As such, a proposed parking provision of 264 resident car parking spaces for the proposed development complies with both the DCP and the ADG.

It is further noted that Section1 Part 8 under the heading of "*General Principles*" in the DCP, it states that:

> *If the standards specified in this Part and other relevant Parts of this DCP is met, then the proposal will meet Council's requirements.*

As noted previously, the proposed resident parking provision complies with the DCP requirement. As such, the proposal meets the standards specified in Part 8, therefore it is considered to meet Council's requirements.

In the light of the above discussion, the proposed car parking provision for residents is satisfactory.

It is noted that if parking was to be provided based on ADG requirement, this would result in at least 31 apartments not having a car space. This could potentially result in parking spilling into the surrounding streets at the detrimental of the local neighbourhood amenities. Conversely, as discussed in Section 6.5, providing additional parking above ADG requirements is not expected to worsen the traffic impacts of the proposed development.

In relation to visitor car parking, it is proposed to provide 53 car parking spaces. The proposed provision complies with ADG requirement, therefore the proposed car parking provision for residential visitors is also satisfactory.

In relation to retail car parking, it is proposed to provide three car parking spaces. The proposed provision complies with DCP requirements, and therefore it is also satisfactory.

In addition, it is noted that the retail car parking spaces are proposed to be allocated to shop owners and/or retail staff. No retail visitor parking spaces are proposed as such are not required for the size and type of retail business anticipated at this location.

Furthermore, the overall parking provision of 320 car parking spaces, although is greater than the ADG's recommended minimum parking requirement (289 car parking spaces), it is less than the DCP's minimum parking requirement (333 car parking spaces). The proposed parking provision, as such, strikes a reasonable balance between the ADG's recommended parking requirement and the DCP minimum parking requirement in that it provides appropriate level of on-site parking for the proposed development without the risks of worsening traffic conditions within the local road network and the overspilling of parking into the neighbourhood streets at the detriments of the local community.

Finally, it is also worthwhile to note that provision of higher parking provision is consistent with the DCP as the DCP under the heading *General Principles* states that:

All proposals should allow for the maximum amount of car parking possible or Council might not be able to approve a future proposal because of a lack of parking.

5.3 Accessible Parking

The DCP states that residential flat buildings are to have a minimum of 10 per cent of the proposed dwellings to be provided as adaptable units. In this case, this equates to 27 adaptable units.

In addition, the DCP also requires one accessible car parking spaces to be provided for each adaptable unit. This requirement is consistent with the requirement from the Australian Standard for Adaptable Housing AS4299:1995. As such, the proposed development is required to provide 27 accessible car parking spaces for residents.

It is proposed to provide a total of 27 accessible car park spaces for residents. This level of accessible car parking spaces for residents complies with both the DCP and AS4299.

In relation to accessible car parking for visitors, the DCP has no specific requirement. Notwithstanding, it is proposed to provide accessible car parking spaces for visitors at a rate of one accessible car spaces per 20 visitor car parking spaces or five per cent. A total of 53 visitor car parking spaces is proposed which translates to a requirement of three accessible visitor car parking spaces. Three accessible visitor car parking spaces have been proposed.

The proposed provisions of 27 accessible car parking spaces for residents and three accessible car parking spaces for visitors are therefore this is satisfactory.

5.4 Bicycle Parking

The relevant required bicycle provision rates from the DCP are as follow:

- residents – one bicycle parking space per 10 dwellings in an accessible communal area if no lockable garage provided
- residential visitors - one bicycle parking space per 10 dwellings in an accessible communal area
- retail employees – one bicycle parking space per 20 employees, and
- retail visitors - one bicycle parking space per 250m^2 GFA.

On this basis, the proposed development is required 56 bicycle parking spaces comprising:

- 27 x resident bicycle parking spaces
- 27 x residential visitor bicycle parking spaces

- 1 x retail staff bicycle parking space (noting that the number of retail employees would be significantly less than 20), and
- 1 x retail visitor bicycle parking space.

It is proposed to provide 56 bicycle parking spaces located in the following area:

- Basement Level B2 – 18 spaces
- Basement Level B1 – 10 spaces
- Ground Floor – 14 spaces, and
- Level 01 – 14 spaces.

The proposed bicycle parking provision is therefore satisfactory.

5.5 Motorcycle Parking

The DCP requires motorcycle parking to be provided at a rate of one motorcycle parking space per 25 car parking spaces. Based on a total provision of 320 car parking spaces, the DCP requires 13 motorcycle parking spaces to be provided.

The architectural plans show a total of 13 motorcycle parking spaces on Basement Level B2. Therefore, motorcycle parking provision is satisfactory.

5.6 Service and Delivery Vehicle Requirements

The proposed development includes an on-site loading bay. The proposed loading bay is located on Basement Level B2. It has been designed to accommodate service vehicles up to Inner West Council's 10.4m long waste collection vehicle. It is noted that if required the loading area can accommodate multiple service vehicles of various size and still permit independent manoeuvring as follow:

- one 10.4m long waste collection and two Australian Standard 6.4m long small rigid vehicles, or
- two Australian Standard 8.8m medium trucks, or
- at least three Australian Standard 6.4m long small rigid vehicles.

It is proposed for the service vehicles to share access with general traffic accessing the car park from the Thomas Street access.

It is further noted that the proposed loading area will also be used by other delivery vehicles and removalist trucks.

Therefore, the proposed loading bay is satisfactory.

5.7 Car Wash Bay

The DCP requires one car wash bay to be provided for residential flat buildings.

It is proposed to comply with the above requirement. As such, the proposed development includes one car wash bay which is located on Basement Level B2. The proposed car wash bay has dimensions of 3.5m wide by 5.4m long.

In addition, the car wash bay is also proposed to be used as a visitor car parking space.

5.8 Car Park Design Review

The car parking spaces have been designed to comply with Australian Standard Class 1A parking facilities for residents. Class 1A requires car spaces to have dimensions of 2.4m wide by 5.4m long with an aisle width of 5.8m.

The accessible car spaces and the adjacent shared area have been designed to comply with AS2890.6 and AS4299. AS2890.6 requires accessible car parking spaces and associated shared area to have dimensions of 2.4m wide by 5.4m long. AS4299 requires the accessible car parking spaces to have dimensions of 3.8m by 5.4m. AS4299 does not require shared area to be provided.

There is a total of 19 accessible car parking spaces with dimensions in compliance with AS2890.6 and 11 accessible car parking spaces with dimension in compliance with AS4299.

The car park review also assessed the following design elements:

- an additional of width of 0.3m has been provided for car spaces adjacent to a wall
- all columns are located outside of the parking space design envelope
- minimum clear head heights of 2.2m for residential car parking spaces and 2.5m for accessible parking spaces are provided within the basement car park as required by AS2890.1, AS2890.6 and AS4299
- the width and length of the parking spaces and the width of the aisle comply with the minimum requirements stipulated in AS2890.1
- the proposed driveways include pedestrian sight triangles at the boundary measuring 2.0m by 2.5m as per AS2890.1 Figure 3.3
- the first 6m of all access ramps/driveways has a maximum vertical grade of 1:20 in accordance with AS2890.1
- maximum vertical grade of 1:4 with 2m transitions at 1:8 have been provided along ramps used by passenger vehicles in accordance with AS2890.1, and

- maximum vertical grade of 1:6.5 with 1:16 transitions have been provided along ramp used by service vehicle in accordance with AS2890.2.

The design of the proposed parking layout generally complies with the design requirements set out in the Australian Standard for car parking facilities in AS2890.1, AS2890.2 and AS2890.6.

Swept path analysis of the relevant design vehicles entering and leaving the basement car park has been conducted. This demonstrates that a 10.4m long waste collection and a 5.2m long B99 vehicle can enter and exit the car park independent of each other without any issues. The swept path diagrams are provided in Appendix B.

The proposed loading bay has minimum dimensions of 10.4m long by 3.5m wide with 4.5m headroom above the loading bay and any truck manoeuvring area. The proposed dimensions comply with the Australian Standard AS2890.2.

Service vehicles can enter and exit the loading area in a forward direction. This is demonstrated in the swept path diagrams contained in Appendix B.

As noted previously, it is proposed to provide a median strip on Thomas Street to restrict vehicle movements to left-in and left-out movements. The median strip would be designed to comply with any specific design requirements from TfNSW and Inner West Council. It would have a minimum width of 0.9m and would be approximately 12m in length. As demonstrated by the swept path diagrams in Appendix B, access by an Australian Standard B99 vehicles to properties on the opposite side of Thomas Street would continue to be possible.

In relation to signage requested by Council in the pre-DA minutes for the Thomas Street and Cavill Avenue accesses such as "NO RIGHT TURN", "ALL TRAFFIC LEFT", "STOP GIVE WAY TO PEDESTRIAN" and speed bumps, it is agreed that these measures would improve pedestrian safety. As such, it would be appropriate for these to be included in the consent conditions to ensure these measures are implemented prior to the occupation of the building.

Therefore, the design of the proposed car park, loading area and associated elements is satisfactory.

6 Traffic Assessment

6.1 Traffic Generation

The traffic generation potential of the proposed development has been assessed using suggested traffic generation rates sourced from guidelines produced by TfNSW.

The applicable traffic generation rates (from the *Guide to Traffic Generating Developments* and *Guide to Traffic Generating Developments Updated Traffic Surveys, TDT 2013/04a*) are as follow:

- morning peak – 0.19 vehicle trips per peak hour per dwelling, and
- evening peak – 0.15 vehicle trips per peak hour per dwelling.

In relation to the retail use, it is noted that the retail use is proposed to be provided as a single tenancy to suit a small scale local shop. It is expected that the nature of the proposed retail use would be a low scale, small shop serving the local community. It is expected that the majority of custom for the proposed retail tenancy would be generated by walk-ins from residents living and workers working in nearby developments including the subject proposed development. As such, the retail component is not expected to generate any additional vehicle trips. Furthermore, any development traffic arising from the retail use would be due to shop owners and their staff which is expected to occur well outside of the peak periods.

Notwithstanding, for traffic analytical purposes, the retail use has been conservatively assumed to generate traffic at the same level as commercial tenancies using the TfNSW traffic generation rate of 1.6 vehicle trips per peak hour per 100m^2 floor area in both peak periods.

In terms of traffic distribution, it is expected that residential traffic would be distributed 20 per cent inbound and 80 per cent outbound during the morning peak. For retail traffic, it is expected that this would be distributed 100 per cent inbound in the morning peak period. The reverse is true for both cases in the evening peak period.

Using the above traffic generation rates and distribution assumptions, Table 6.1 presents the estimated development traffic for the proposed development with 264 residential apartments and a single retail tenancy with 120m^2 of floor area.

Table 6.1: Traffic Generation Estimates

Proposed Land Use	Morning Peak Period			Evening Peak Period		
	In	Out	2-Way	In	Out	2-Way
Residential (265 Apts)	10	40	50	32	8	40
Retail (120m^2)	2	0	2	0	2	2
Total	**12**	**40**	**52**	**32**	**10**	**42**

From the above, the proposed development with 264 apartments and a 120m^2 retail tenancy is expected to generate 52 two-way vehicles per hour (vph) and 42 vph during the morning and evening peak periods, respectively. This represents less one vehicle movement per minute during the busiest period. This level of development is considered to be low, and is not expected to generate any discernible traffic impacts to the surrounding road network.

It is noted that the traffic report prepared as part of the planning proposal (which has been approved by Inner West Council with the LEP applicable to the site amended) estimated the proposed development envisaged in the planning proposal would generate approximately 78 vph. The current DA scheme generates less development traffic the planning proposal scheme by some 36 per cent.

It is further noted that the existing use has been estimated to generate approximately 223 vph during the busiest period. The proposed development, therefore, is expected to generate some 171 vph less traffic than the existing use. As such, the proposed development is not expected to create any noticeable adverse traffic impacts to the surrounding road network. Instead, it is expected that the proposed development would provide positive traffic benefits to the surrounding road network.

Notwithstanding the above, Council in their pre-DA minutes has requested for "*existing and anticipated intersection performance*" analysis based on "*pre-COVID 19 conditions*" be conducted at the following intersections:

- Thomas Street-The Avenue
- Thomas Street-Liverpool Road, and
- Liverpool Road-Cavill Avenue.

Below is a discussion of the "*existing and anticipated intersection performance*" analysis undertaken and its findings.

6.2 Intersection Performance Analysis

The intersection performance analysis requested by Council has been undertaken using the methodology described below. The methodology has been agreed with Council's traffic engineer during a site meeting held on 23 September 2020 and confirmed in an email dated 5 October 2020.

SCATS detector volume data has been obtained from TfNSW for the Liverpool Road intersection with Thomas Street. Council has requested for the analysis to be conducted based on pre-COVID traffic condition. As such, the SCATS data was obtained for Thursday 24 October 2019. The data provides traffic volumes for each individual traffic movement at the intersection in 15-minute intervals over the course of a day enabling peak hour volumes to be determined. SCATS traffic signal timing for the same day was also obtained for input into the traffic model.

The SCATS data for the Liverpool Road-Thomas Street intersection has also been used to determine the passing volumes along Thomas Street at its intersection with The Avenue and along Liverpool Road at its intersection with Cavill Avenue.

Traffic volumes for the turning movements to and from The Avenue has been estimated based on the number of residential dwellings and kerbside parking spaces available on The Avenue. The traffic estimates for The Avenue including the assumed trip rates are presented in Table 6.2.

Some properties have vehicular accesses on a second frontage road in addition to The Avenue, while some properties have no access to The Avenue. Properties that have access to The Avenue as well as another frontage road, it is assumed traffic would be evenly distributed to both access roads. Kerbside parking spaces on The Avenue have been conservatively assumed to generate traffic at a rate of one 2-way vehicle trip per hour per car space.

Table 6.2: Estimated Peak Hour Traffic on The Avenue

Property No.	No. of Dwellings	Type of Dwellings	Access to The Avenue	Trip Rates (Trips per Hour per Dwelling/Car Space)	Estimated 2-Way Trips per Hour
No. 1	3	Townhouses	Yes	0.65	2.0
No. 2	1	Detached Dwelling	No	1.0	0.0
No. 3-5	12	Medium Density Multi Dwelling Building	Yes	0.65	7.8
No. 4	1	Detached Dwelling	Yes	1.0	1.0
No. 6-10	21	High Density Flat Building	No	0.19	0.0
No. 7	11	Medium Density Multi Dwelling Building	Yes	0.65	7.2
No. 9	3	Medium Density Multi Dwelling Building	Yes	0.65	2.0
No. 11	4	Medium Density Multi Dwelling Building	Yes	0.65	2.6
No. 12	10	Medium Density Multi Dwelling Building	No	0.65	0.0
No. 13	4	Medium Density Multi Dwelling Building	Yes	0.65	2.6
No. 14	10	Medium Density Multi Dwelling Building	Shared	0.65	3.3
No. 15	60	High Density Flat Building	Shared	0.19	5.7
No. 16	1	Detached Dwelling	Yes	1	1.0
Kerbside Car Spaces	29	-	Yes	1.0	29.0
Total	**-**	**-**	**-**	**-**	**62.1**

On this basis, the two-way traffic to and from The Avenue have been estimated to be approximately 62 vph as shown in Table 6.2.

Traffic volumes for turning movements to and from Cavill Avenue have been provided by Council from a traffic count conducted on 28 June 2017.

At the request of Council, development traffic from the recently completed development at 5 Markham Place has also been included in the assessment noting that this development would have been completed and occupied before 24 October 2019 (the date of the SCATS data, therefore any development traffic would have been included in the SCATS data). The development at 5 Markham Place includes 93 residential apartments with approximately 179m^2 of retail floor area. Using the same traffic generation rates discussed earlier, the development at 5 Markham Place has

been estimated to generate 21 vph and 17 vph during the morning and evening peak periods, respectively.

As noted previously, the existing use on the site (with 279 car parking spaces), which will be displaced by the proposed development, has been estimated to generate 223 vph during the peak periods. To provide a conservative assessment, the development traffic due to the existing use has not be discounted in this assessment.

Three modelling development scenarios have been assessed. These scenarios are:

- Scenario One – existing traffic conditions (without proposed development, but include existing use traffic), the resultant morning and evening peak hour intersection turning movement volumes for this scenario is presented in Figure 6.1
- Scenario Two – post development traffic conditions with no discount of existing use traffic (i.e. Scenario One traffic conditions) and accesses on Thomas Street and Cavill Avenue, the resultant morning and evening peak hour intersection turning movement volumes for this scenario is presented in Figure 6.2, and
- Scenario Three – as per Scenario Two, but with vehicular access on Thomas Street only, the resultant morning and evening peak hour intersection turning movement volumes for this scenario is presented in Figure 6.3.

Figure 6.1: Existing Morning and Evening Condition Traffic Volumes

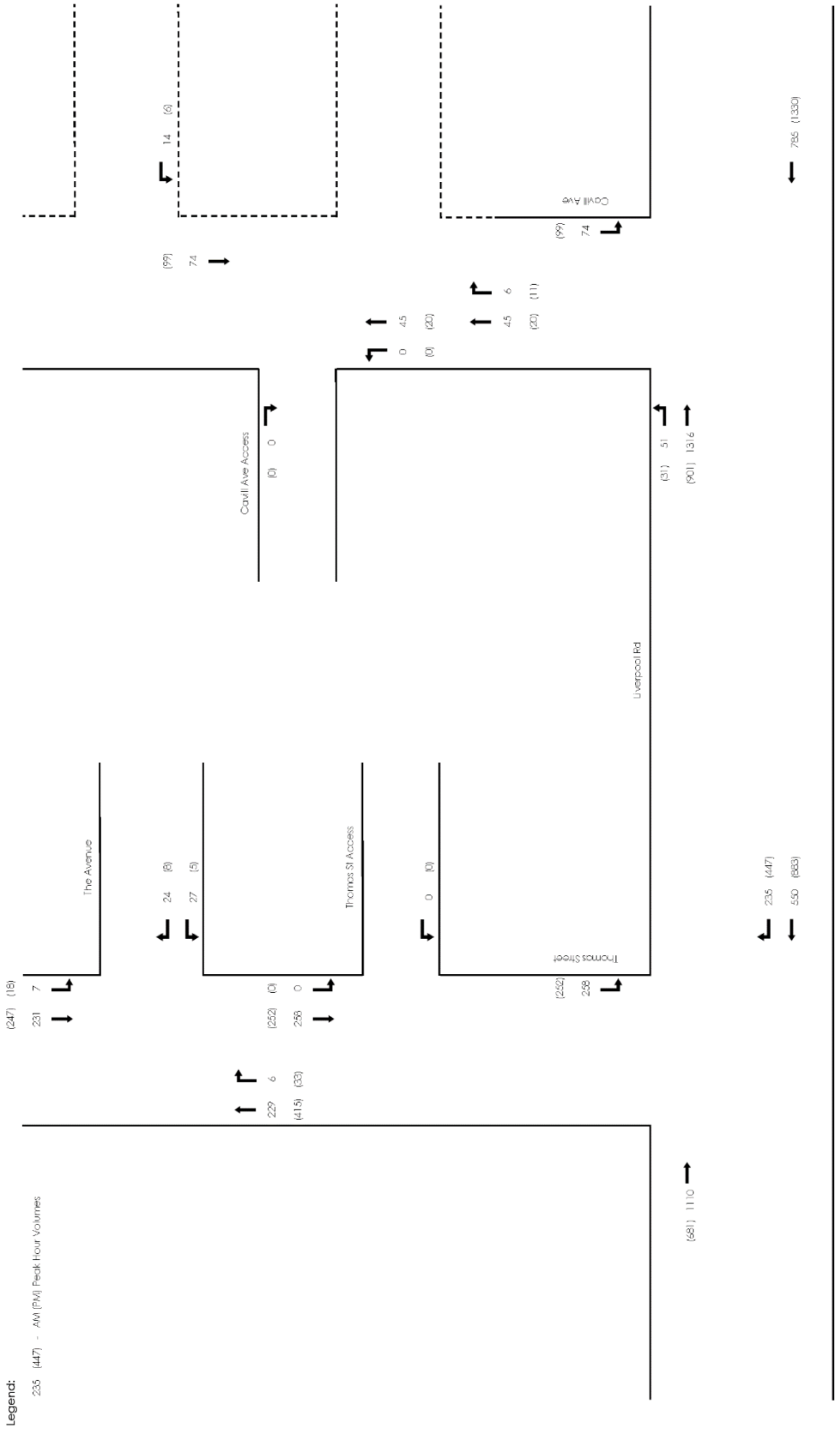


Figure 6.2: Future (with Development + Thomas St and Cavill Ave Accesses) Morning and Evening Condition Traffic Volumes

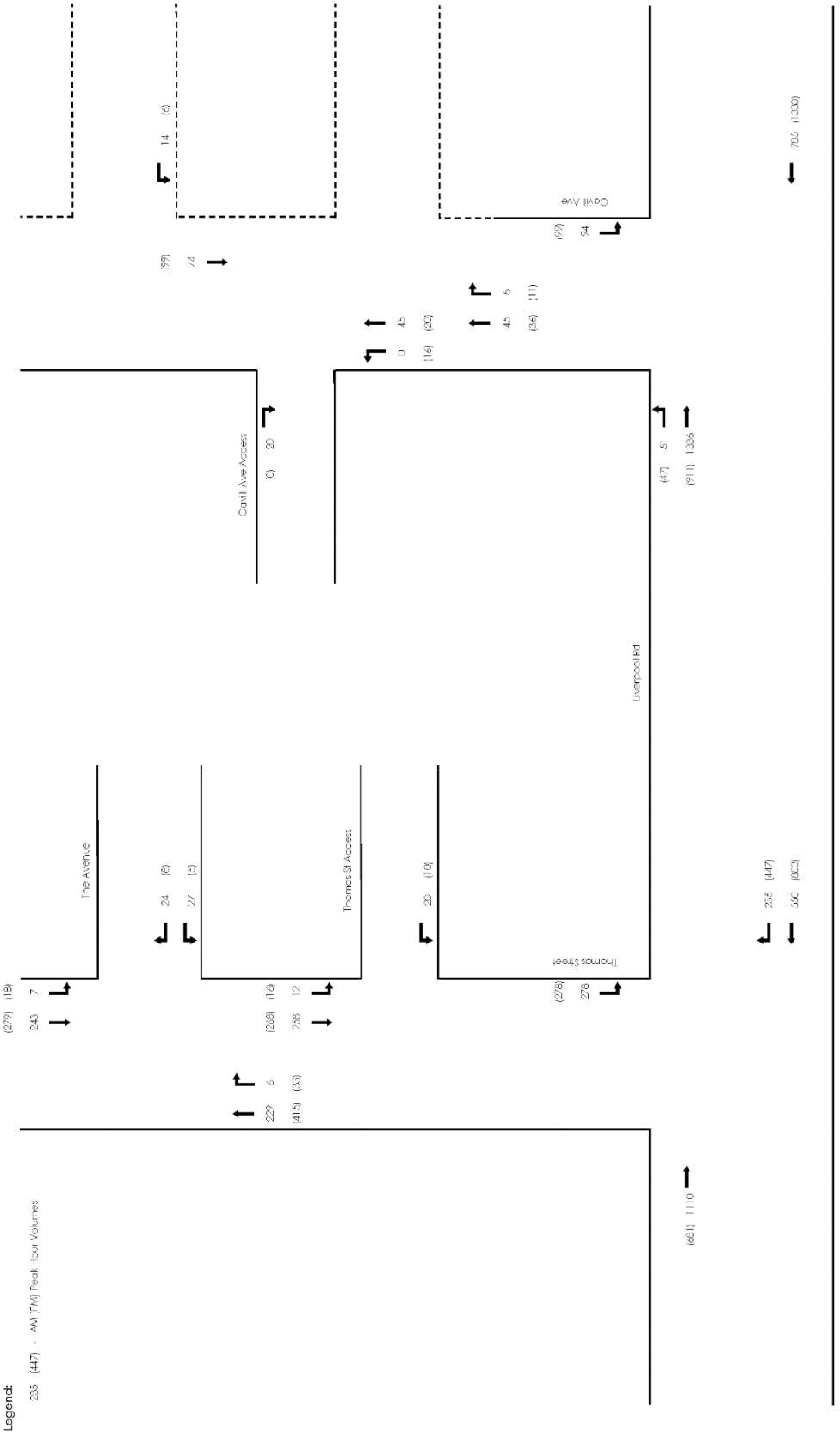
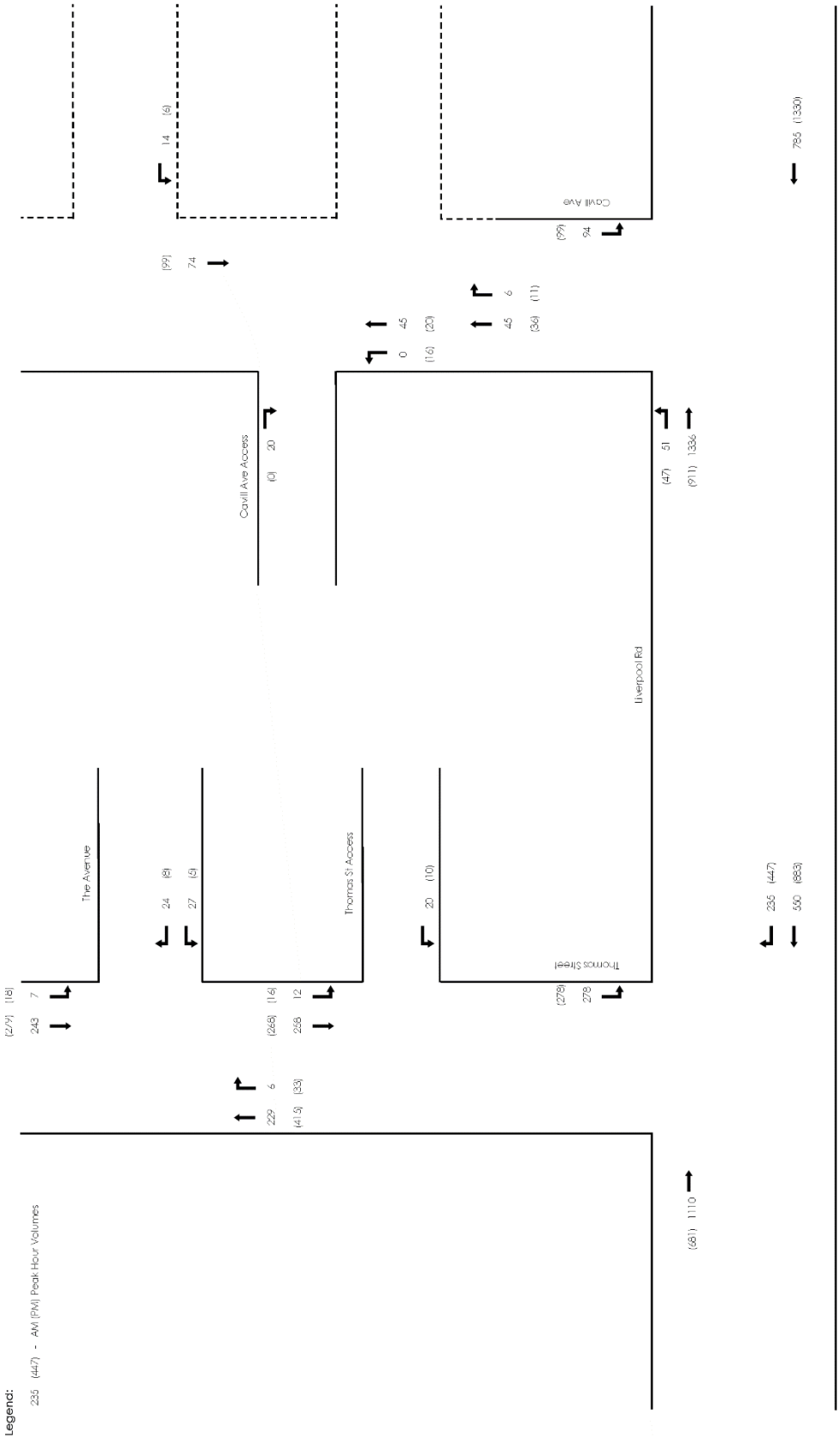


Figure 6.3: Future (with Development + Thomas St Access Only) Morning and Evening Condition Traffic Volumes



6.3 Intersection Modelling Criteria

Capacity analysis of the nearby intersections has been undertaken using SIDRA Intersection 8, a computer-based modelling tool which assesses intersection performance under prevailing traffic conditions.

SIDRA calculates intersection performance measures such as average delay that vehicles encounter travelling through the intersection and the level of service (LoS). SIDRA provides analysis of the operating conditions which can be compared to the performance criteria set out in Table 6.3.

TfNSW uses level of service as a measure of how efficient a given intersection is operating under prevailing traffic conditions. The level of service ranges from A to F. Levels of service between A and D indicate the intersection is operating within capacity with LoS A providing exceptionally good performance to LoS D indicating satisfactory performance. LoS E and F indicate the intersection is operating at or near capacity and would require intersection improvement works to maintain reasonable performance.

The level of service is directly related to the average delay experience by vehicles travelling through the intersection as presented in Table 6.3. At signalised intersections, the average delay is the volume weighted average of all movements. For roundabouts and give way/stop sign controlled intersections, the average delay relates to the worst movement.

Table 6.3: Level of Service Criteria for Intersections

Level of Service	Average Delay (seconds per vehicle)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity, at signals, incidents will cause excessive delays. Roundabouts require order control mode	At capacity, requires other control mode
F	Greater than 71	Additional capacity would be required	Unsatisfactory with excessive queuing; intersection improvements would be required

Source: TfNSW (formerly Roads and Maritime Services) Guide to Traffic Generating Developments, 2002

6.4 Analysis Results

The summary results from the above intersection performance analysis requested by Council are presented below in Table 6.4 for the morning peak period and in Table 6.5 for the evening peak period. Detailed SIDRA modelling output are provided in Appendix C.

Table 6.4: Morning Peak Analysis Results

Intersection	Intersection Control	Existing Condition		Future Condition with Cavill Ave Access		Future Condition without Cavill Ave Access	
		Ave. Delay (sec)	LoS	Ave. Delay (sec)	LoS	Ave. Delay (sec)	LoS
Thomas St-The Avenue	Priority	7	A	8	A	8	A
Thomas St Access	Priority	N/A	N/A	7	A	7	A
Liverpool Rd-Thomas St	Traffic Signals	16	B	17	B	18	B
Liverpool Rd-Cavill Ave	Priority	9	A	7	A	9	A
Cavill Ave Access	Priority	N/A	N/A	5	A	N/A	N/A

Table 6.5: Evening Peak Analysis Results

Intersection	Intersection Control	Existing Condition		Future Condition with Cavill Ave Access		Future Condition without Cavill Ave Access	
		Ave. Delay (sec)	LoS	Ave. Delay (sec)	LoS	Ave. Delay (sec)	LoS
Thomas St-The Avenue	Priority	9	A	10	A	10	A
Thomas St Access	Priority	N/A	N/A	7	A	6	A
Liverpool Rd-Thomas St	Traffic Signals	12	A	12	A	12	A
Liverpool Rd-Cavill Ave	Priority	7	A	5	A	7	A
Cavill Ave Access	Priority	N/A	N/A	5	A	N/A	N/A

The analysis indicates the assessed intersections currently operate satisfactorily with good performance and level of service, LoS B or better, in both peak periods.

Following the completion of the proposed development, the assessed intersections would continue to perform satisfactorily. They would continue to operate with good performance and level of service consistent with that found under existing conditions.

The intersections in the future would have consistent delays and level service as existing conditions. The proposed development would not result in any material traffic impacts.

This is the case whether the proposed development has one access from Thomas Street or two accesses from Thomas Street and Cavill Avenue. That is, it is not necessary to provide a second access to serve the proposed development. It would not provide any traffic benefits to the operation of the nearby intersections.

In addition, as noted previously the assessment has not discounted any existing use development traffic which would be displaced by the proposed development and therefore, any analysis results from this assessment would be overly conservative.

In the light of the above, mitigation works to the external road network would not be required. The existing road network has more than adequate capacity to accommodate the additional development traffic.

6.5 Traffic Effects of Additional Parking Provision Above ADG Requirements

TfNSW's *Guide to Traffic Generating Developments Updated Traffic Surveys, TDT 2013/04a*, in additional to the traffic generation rates based on the number of dwellings as discussed above, also suggests the following equivalent traffic generation rates based on car parking spaces:

- morning peak – 0.15 vehicle trips per peak hour per car space, and
- evening peak – 0.12 vehicle trips per peak hour per car space.

Table 6.6 below compares the expected the development traffic generating by the different level of parking requirements/provisions from the DCP, ADG, proposed parking provision against those adopted in the intersection performance analysis discussed above.

Table 6.6: Traffic Generation Based on Car Parking Provision

No. of Proposed Car Parking Spaces	Morning Peak	Evening Peak
DCP – 333 Car Spaces	50 vph	40 vph
ADG – 289 Car Spaces	43 vph	35 vph
Proposed – 320 Car Spaces	48 vph	38 vph
Assessed Level of Development Traffic	52 vph	42 vph

From Table 6.6, it can be seen that at the level of proposed parking provision (320 car parking spaces) the proposed development is expected to generate 48 vph during the

busiest peak period. This compares to 43 vph based on the minimum number of parking requirements from the ADG resulting in a difference of 5 vph during the busiest peak period. The difference of 5 vph is considered to be low and is not expected to generate any discernible traffic effects to the operation and performance of nearby intersections.

Furthermore, this traffic assessment has adopted development traffic higher than any of the expected development traffic estimated based on the number of car parking spaces provided. Using the highest estimated development traffic, results from the traffic assessment indicate that the nearby intersections would continue to operate satisfactorily following the completion of the proposed development.

Finally, it is noted that the general view (often made by laypersons) "reducing the number of car parking spaces will reduce the number of traffic movements" can be misleading when considering the traffic generation potential of development proposals.

Indeed, the level of on-site parking provision is one consideration, however there are other factors that would determine the level of development traffic. Ignoring the detailed relationships that exist between parking and the reasons for travel could potentially lead to unintended consequences and impacts to the surrounding road network and community, such as increased demand for on street parking.

This is particularly relevant to high density residential developments located within close proximity to good quality public transport services and facilities like that of the subject proposed development. Factors influencing travel mode choice would include:

- access to public transport at both the origin and destination of the trip, and
- availability of parking at the destination end of the trip.

It needs to be recognised that not all trips are possible or desirable to be made by public transport. However, once the decision to own a vehicle is made, there is a requirement to park or store the vehicle somewhere. It should also be recognised that the need to park the vehicle is not necessarily related to the level of car usage or number of vehicle trips made.

For high density residential developments within close proximity to public transport, the availability of efficient and convenient public transport makes public transport a very attractive choice over the private motor vehicle. The result being that the car stays parked onsite and not used for most trips.

The above has been confirmed by traffic generation surveys undertaken by TfNSW which show that high density residential developments within close proximity to public transport nodes generate significantly less development during the peak periods than those located further away from public transport nodes.

Therefore, it can also be concluded that the level proposed of parking provision would not result in any discernible traffic impacts to the surrounding intersections.

7 Summary and Conclusion

This report examines the traffic and parking implications of a proposed mixed use development at 2-6 Cavill Avenue and 1-9 Thomas Street, Ashfield. The salient findings of this assessment are presented below.

- The proposed development involves the demolition of all existing buildings on the site and construct in their place four new residential buildings accommodating 264 apartments and one ground floor retail tenancy.
- Vehicular access to the car park is proposed to be provided off Thomas Street and Cavill Avenue in the same locations as the existing access. The Thomas Street access is proposed as the main access catering for resident, visitors and service vehicle traffic, while the Cavill Avenue access is a secondary access reserved for resident traffic only. The existing accesses on The Avenue are proposed to be removed.
- Loading/unloading activities will occur on-site within a dedicated loading bay located on Basement Level B2. The loading bay has been designed to accommodate service vehicles up to Council's 10.4m long waste collection vehicle. The loading area would be used by all service vehicles including waste collection, removalist vehicles and delivery of bulky items. Service vehicles can enter and exit the site in a forward direction.
- The DCP requires a total of 333 car parking spaces to be provided. The ADG requires a total of 289 car parking spaces. It is proposed to provide a total of 320 car parking spaces to serve the proposed development. As explained in this report, the proposed parking provision complies with both the DCP and ADG noting that SEPP 65 states that a development application cannot be refused on parking grounds if the proposed development proposes car parking equal to or greater than the recommended minimum parking from the ADG.
- The proposed overall parking provision of 320 car parking spaces strikes a reasonable balance between the DCP and ADG requirements without the risks of adverse traffic and parking impacts to the local community.
- Bicycle and motorcycle parking spaces have been provided in compliance with requirements stipulated in the DCP.
- The design of the car park complies and/or meets the design intents stipulated in the relevant Australian Standard for car parking facilities, namely AS2890.1, AS2890.2, AS2890.3, AS2890.6 and AS4299.
- The proposed development, using traffic generation rates suggested in TfNSW guidelines, has been estimated to generate 52 and 42 vehicles per peak hour during the morning and evening peak periods, respectively.

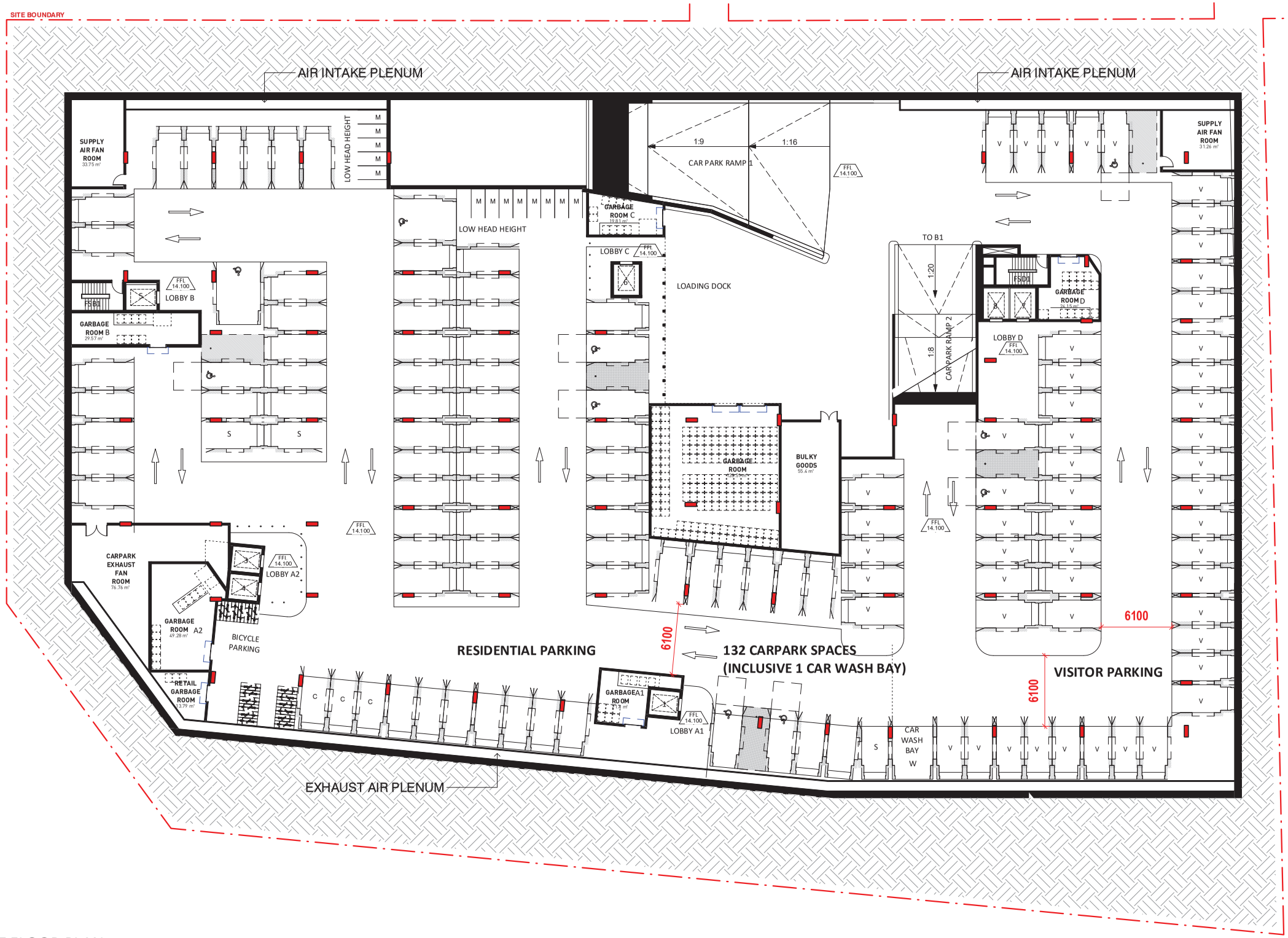
- Intersection analysis of the nearby intersections as per Council's request has been undertaken. This shows that the assessed intersections would continue to operate satisfactorily with the same level of performance as existing traffic condition following the completion of the proposed development.
- The proposed car parking provision above ADG requirement is not expected to generate any material traffic impact to the surrounding intersections.

Overall, from a traffic and parking perspective the proposed development is considered to be satisfactory.

Appendix A

Architectural Car Park Plans

PARKING SCHEDULE									
	RESIDENTIAL		VISITOR			RETAIL			
LEVEL	STANDARD	ACCESSIBLE	STANDARD	ACCESSIBLE	CARWASH BAY	STANDARD	ACCESSIBLE	MOTORBIKE	BYCICLE
LB2	68	7	49	3	1	3	0	13	18
LB1	114	14	0	0	0	0	0	0	10
L00	55	6	0	0	0	0	0	0	14
L01	0	0	0	0	0	0	0	0	14
Car Space Grand Total : 320	237	27	49	3	1	3	0	13	56



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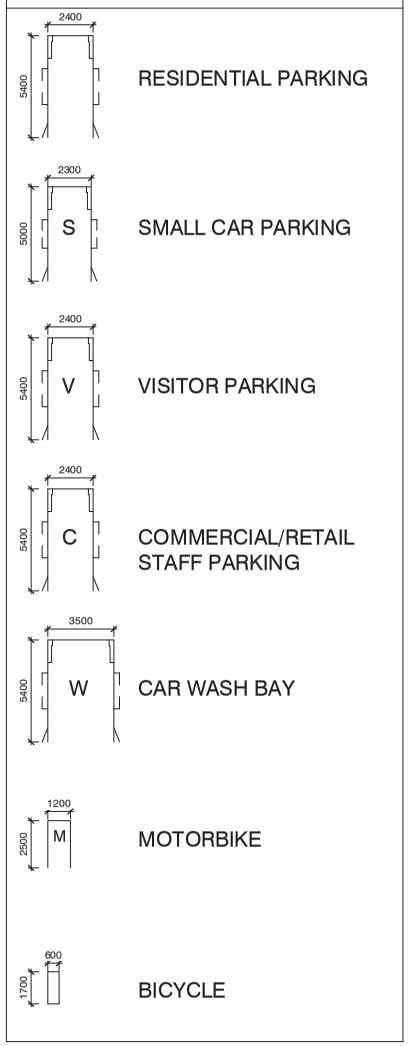
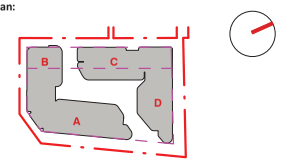


1 B2 BASEMENT FLOOR PLAN

1 : 200 @A1

Rv	Amendment	By	Ck	Date
A	Issue for Development Application	ZS	LG	13/11/2020

Key Plan:



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PTW

0 1 2 5 10 15m

Project Project Number
2-6 CAVILL AVENUE
ASHFIELD

Status
DEVELOPMENT APPLICATION

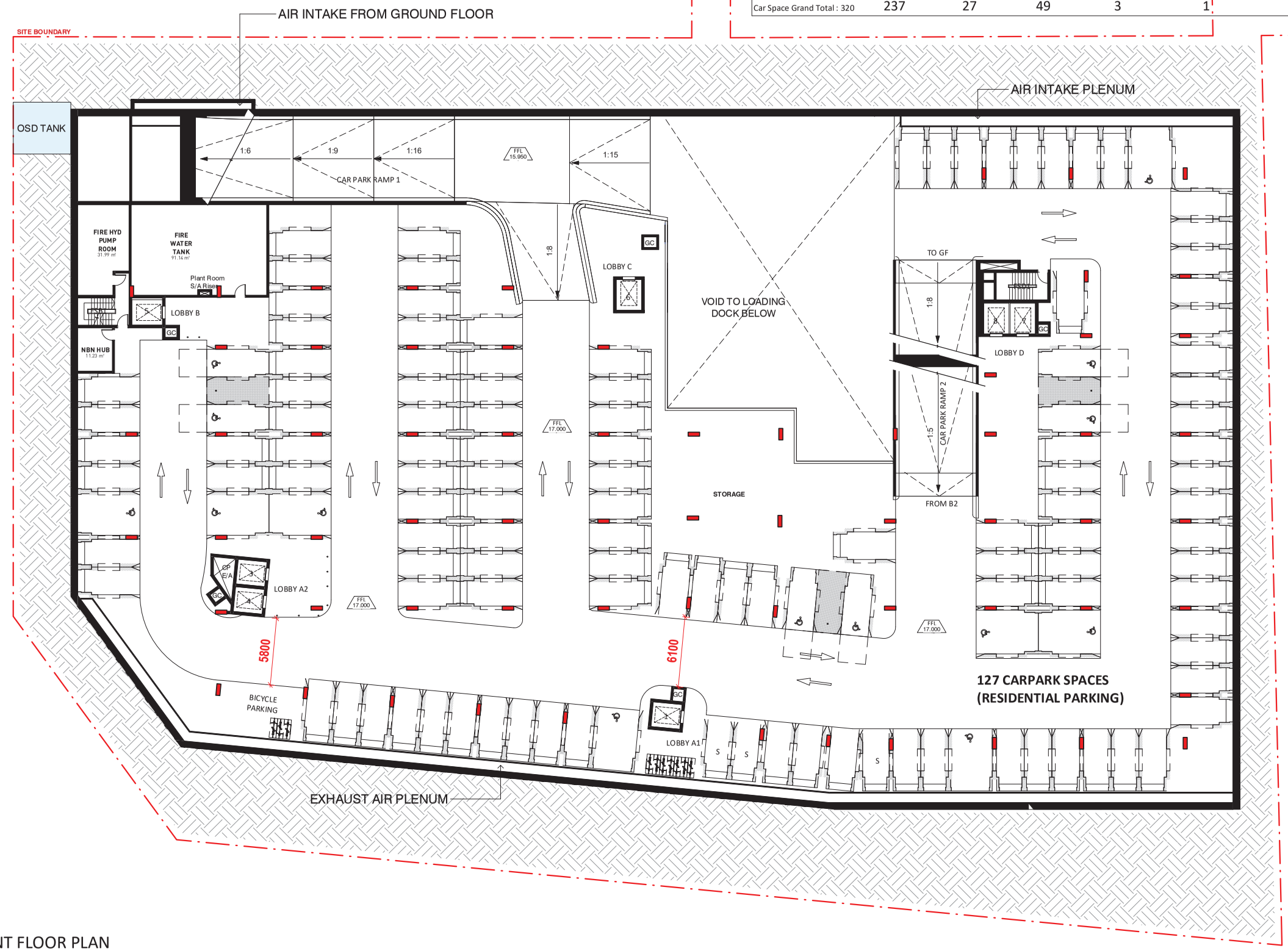
Title
DA DRAWINGS
BASEMENT B2 FLOOR PLAN

Drawing Number DA-080

Revision A

A1

PARKING SCHEDULE									
	RESIDENTIAL		VISITOR			RETAIL			
LEVEL	STANDARD	ACCESSIBLE	STANDARD	ACCESSIBLE	CARWASH BAY	STANDARD	ACCESSIBLE	MOTORBIKE	BYCICLE
LB2	68	7	49	3	1	3	0	13	18
LB1	114	14	0	0	0	0	0	0	10
L00	55	6	0	0	0	0	0	0	14
L01	0	0	0	0	0	0	0	0	14
Car Space Grand Total : 320	237	27	49	3	1	3	0	13	56



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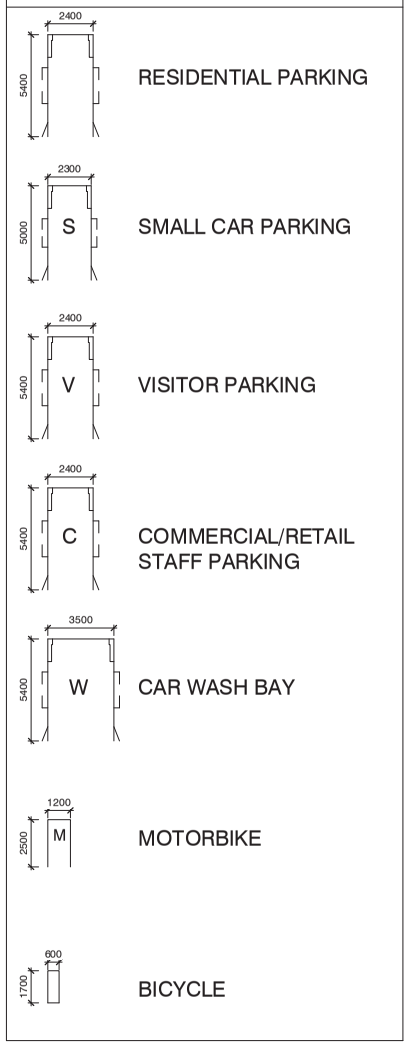

1 B1 BASEMENT FLOOR PLAN

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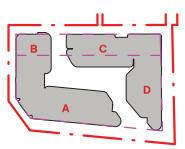
Rv	Amendment	By	Ck	Date
A	Issue for Development Application	ZS	LG	13/11/2020

Key Plan:



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D Jones Architect No.4778

PTW

0 1 2 5 10 15m

Project Project Number

2-6 CAVILL AVENUE
ASHFIELD

Status

DEVELOPMENT APPLICATION

Title

DA DRAWINGS
BASEMENT B1 FLOOR PLAN

Drawing Number DA-090

Revision A

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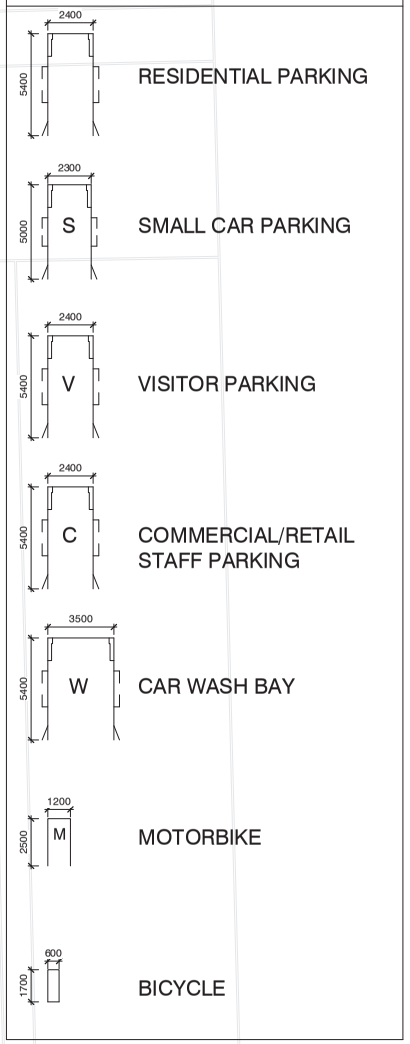
PARKING SCHEDULE									
	RESIDENTIAL		VISITOR			RETAIL			
LEVEL	STANDARD	ACCESSIBLE	STANDARD	ACCESSIBLE	CARWASH BAY	STANDARD	ACCESSIBLE	MOTORBIKE	BYCICLE
LB2	68	7	49	3	1	3	0	13	18
LB1	114	14	0	0	0	0	0	0	10
L00	55	6	0	0	0	0	0	0	14
L01	0	0	0	0	0	0	0	0	14
Car Space Grand Total : 320	237	27	49	3	1	3	0	13	56

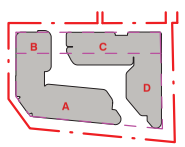
CARSPACE TYPE LEGEND



1 GROUND FLOOR
1 : 200 @A1

Rv	Amendment	By	Ck	Date
A	Issue for Development Application	ZS	LG	13/11/2020

Key Plan:



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D Jones Architect No.4778

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Project Project Number
2-6 CAVILL AVENUE
ASHFIELD

Status
DEVELOPMENT APPLICATION

Title
DA DRAWINGS
GROUND FLOOR PLAN

Drawing Number DA-100

Revision A

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A1

THOMAS STREET

LIVERPOOL ROAD

CAVILL AVENUE

SUBSTATION KIOSK

VOID TO RETAIL

MAIL BOX

OSD UNDER

EX.RL 21.730

EX.RL 22.230

EX.RL 22.946

EX.RL 23.746

EX.RL 23.895

EX.RL 24.036

EX.RL 23.803

EX.RL 22.938

EX.RL 22.447

EX.RL 22.103

1 LEVEL 01

1 : 200 @A1

Rv	Amendment	By	Ck	Date
A	Issue for Development Application	ZS	LG	13/11/2020

Key Plan:

Client

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PTW

0 1 2 5 10 15m

Project Project Number

2-6 CAVILL AVENUE
ASHFIELD

Status

DEVELOPMENT APPLICATION

Title

DA DRAWINGS
LEVEL 01 PLAN

Drawing Number DA-101

Revision A

23 Nov 20 7:13:45 PM

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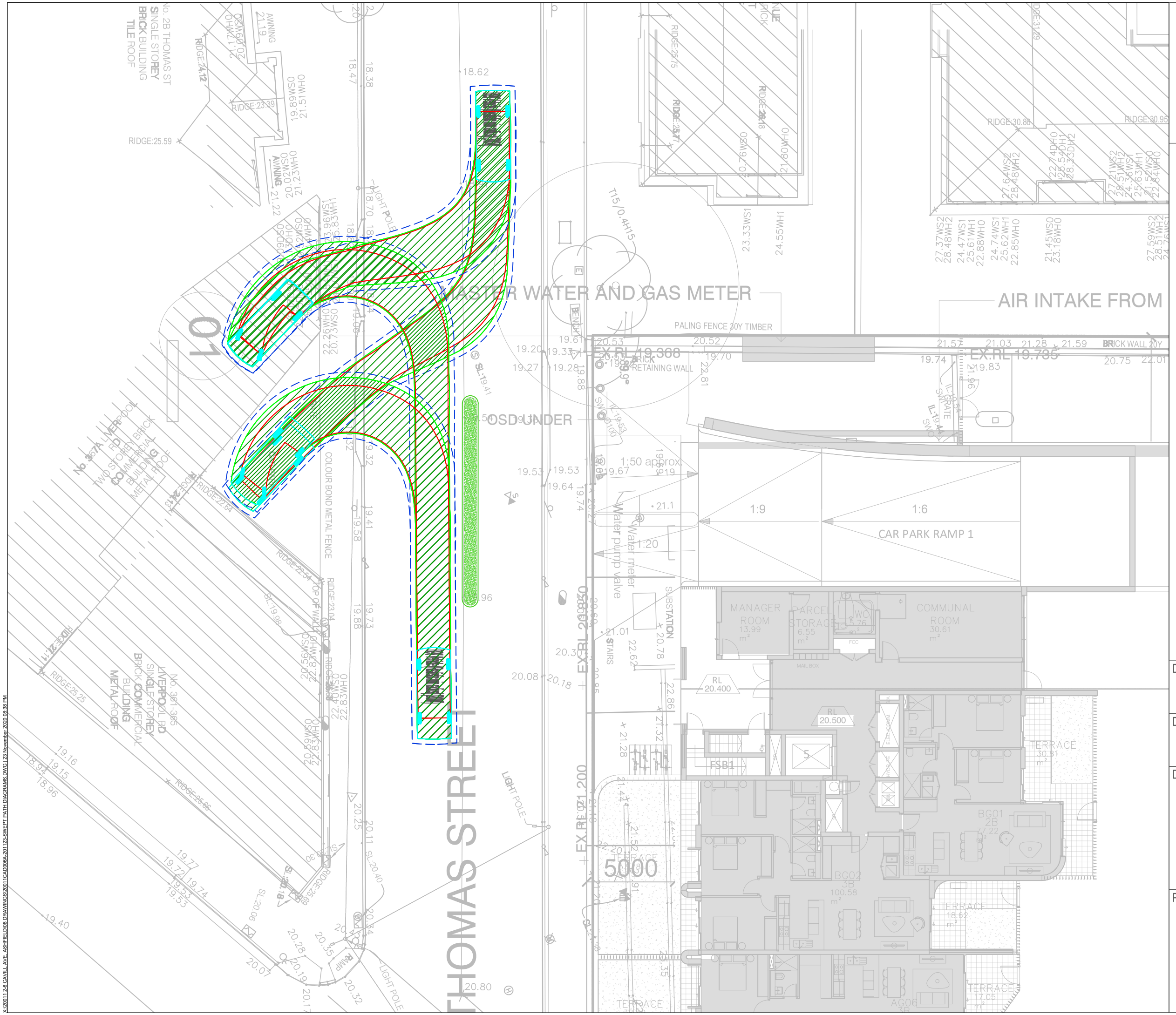
A1

Appendix B

Swept Path Diagrams

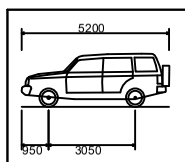


Transport Planning

Zenith Towers | Level 20 | Tower A | The Zenith
821 Pacific Highway | Chatswood | NSW | 2067

KEY:

	Forward	Reverse
Wheel Path		
Body Envelope		
Clearance (300mm)		



B99 Vehicle (Realistic min radius) (2004)

Overall Length	5200mm
Overall Width	1940mm
Overall Body Height	1878mm
Min Body Ground Clearance	272mm
Track Width	1840mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6250mm

DATE:	SCALE:
23 NOVEMBER 2020	1:200@A3

DRAWING NO.:	REV:
20011CAD006A-001	A

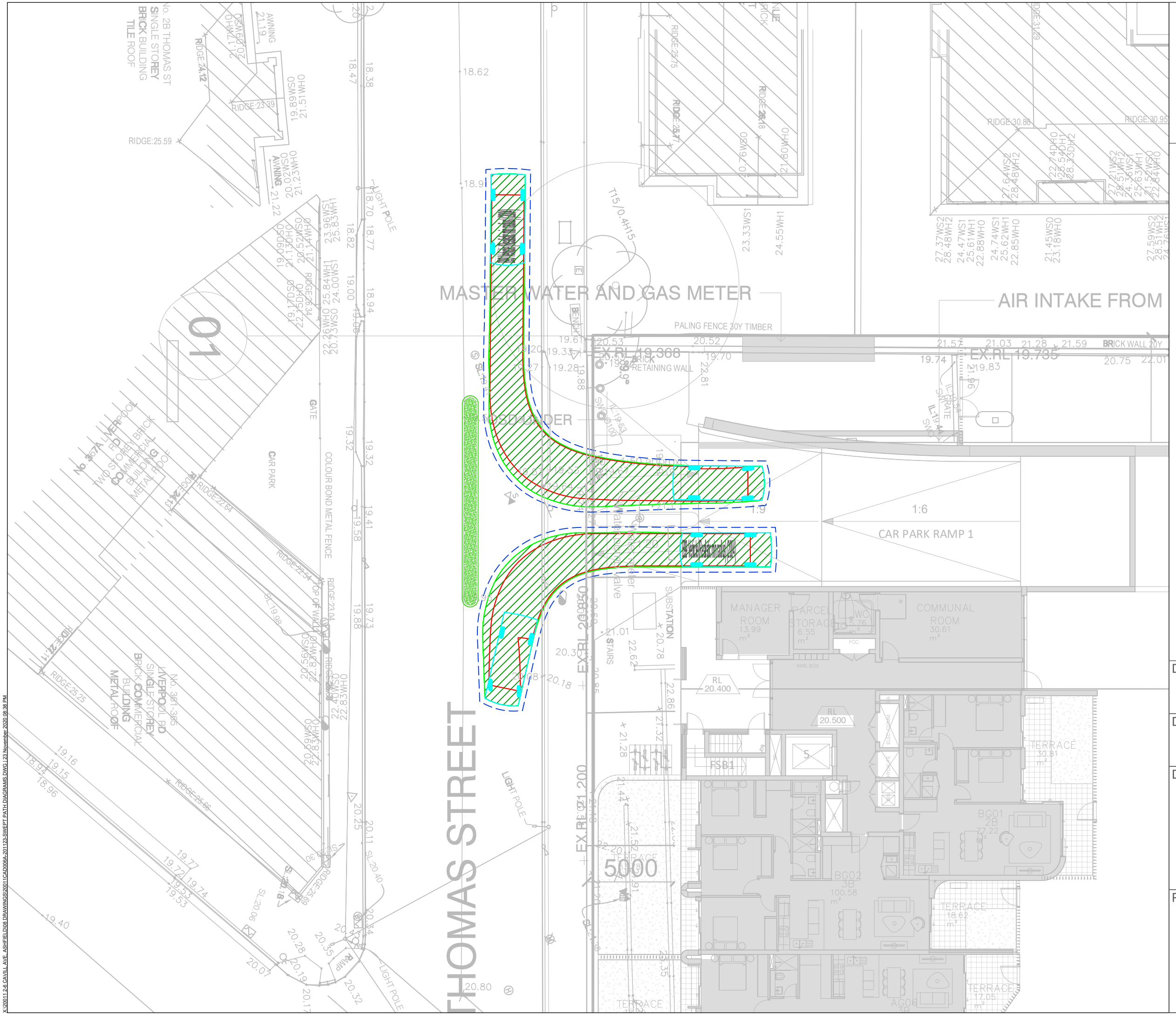
DRAWING TITLE:

SWEPT PATH ANALYSIS - AS2890.1 5.2M B99 VEHICLES ACCESSING ADJOINING PROPERTIES ON THOMAS ST

PROJECT:

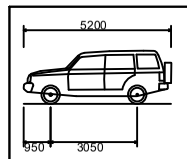
2-6 CAVILL AVE, ASHFIELD

X:\20011 2-6 CAVILL AVE, ASHFIELD\08 DRAWINGS\20011CAD006A-20112\3-SWEPT PATH DIAGRAMS.DWG | 23 November 2020 08:38 PM



KEY:

	Forward	Reverse
Wheel Path		
Body Envelope		
Clearance (300mm)		



B99 Vehicle (Realistic min radius) (2004)

Overall Length	5200mm
Overall Width	1940mm
Overall Body Height	1878mm
Min Body Ground Clearance	272mm
Track Width	1840mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6250mm

Transport Planning
Zenith Towers | Level 20 | Tower A | The Zenith
821 Pacific Highway | Chatswood | NSW | 2067

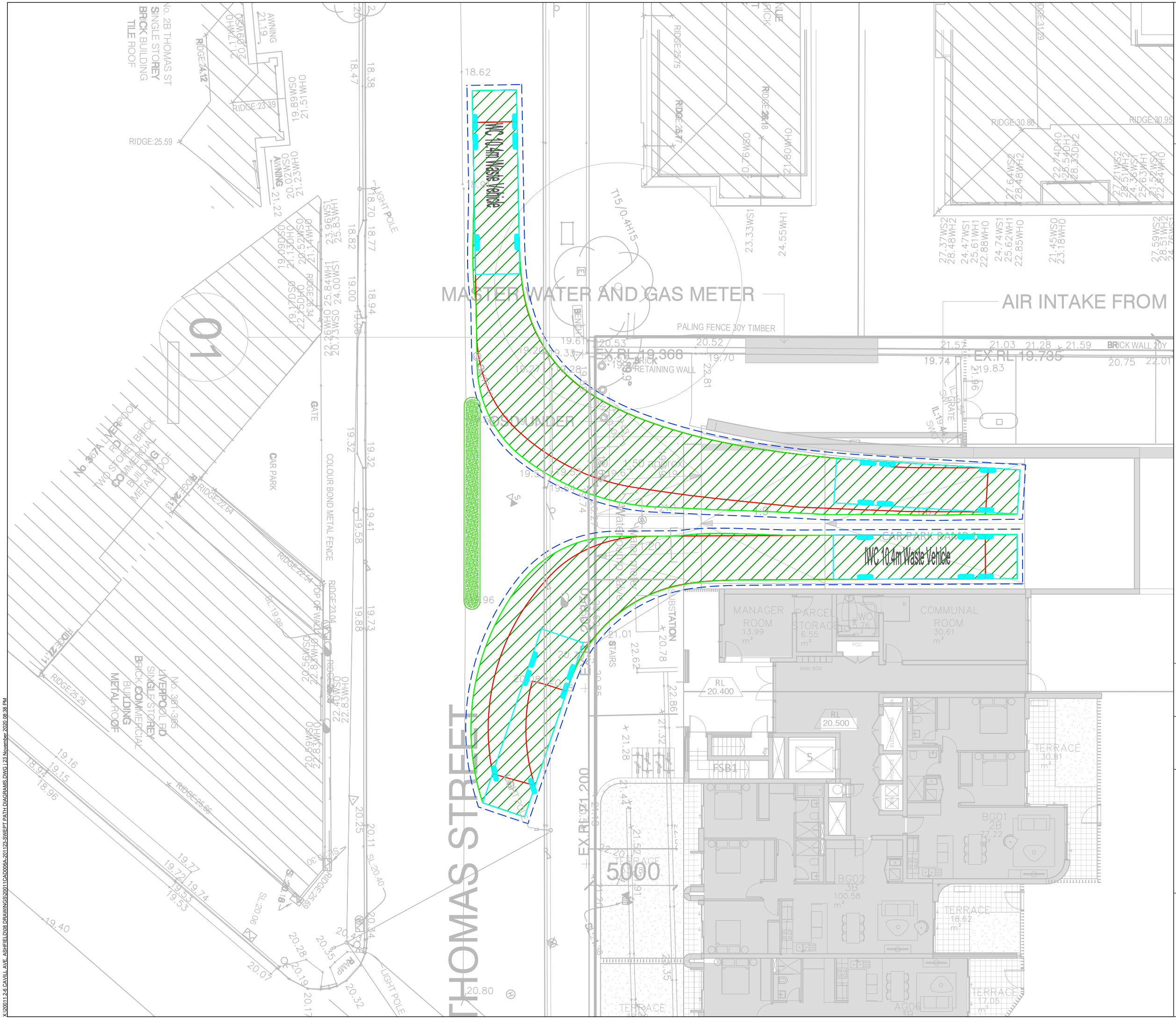
DATE:	SCALE:
23 NOVEMBER 2020	1:200@A3
DRAWING NO.:	REV:
20011CAD006A-002	A

DRAWING TITLE:

SWEPT PATH ANALYSIS - AS2890.1 5.2M B99 VEHICLES ACCESSING THOMAS ST DRIVEWAY

PROJECT:

2-6 CAVILL AVE, ASHFIELD

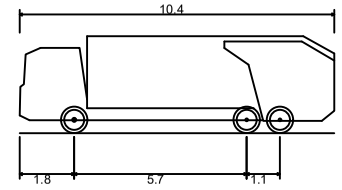


Transport Planning

Zenith Towers | Level 20 | Tower A | The Zenith
821 Pacific Highway | Chatswood | NSW | 2067

KEY:

	Forward	Reverse
Wheel Path		
Body Envelope		
Clearance (300mm)		



IWC 10.4m Waste Vehicle

Overall Length	10.400m
Overall Width	2.500m
Overall Body Height	3.206m
Min Body Ground Clearance	0.411m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	12.500m

DATE:	SCALE:
23 NOVEMBER 2020	1:200@A3

DRAWING NO.:	REV:
20011CAD006A-003	A

DRAWING TITLE:

SWEPT PATH ANALYSIS - COUNCIL 10.4M WASTE VEHICLE ACCESSING THOMAS ST DRIVEWAY

PROJECT:

2-6 CAVILL AVE, ASHFIELD

X:\20011 2-6 CAVILL AVE, ASHFIELD\06 DRAWINGS\20011CAD006A-201123-SWEPT PATH DIAGRAMS.DWG | 23 November 2020 08:38 PM

VEHICLE ENTERING

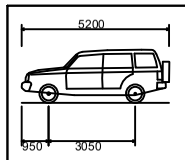
VEHICLE EXITING

Transport Planning

Zenith Towers | Level 20 | Tower A | The Zenith
821 Pacific Highway | Chatswood | NSW | 2067

KEY:

	Forward	Reverse
Wheel Path		
Body Envelope		
Clearance (300mm)		



B99 Vehicle (Realistic min radius) (2004)

Overall Length	5200mm
Overall Width	1940mm
Overall Body Height	1878mm
Min Body Ground Clearance	272mm
Track Width	1840mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6250mm

DATE:	SCALE:
23 NOVEMBER 2020	1:200@A3

DRAWING NO.:	REV:
20011CAD006A-004	A

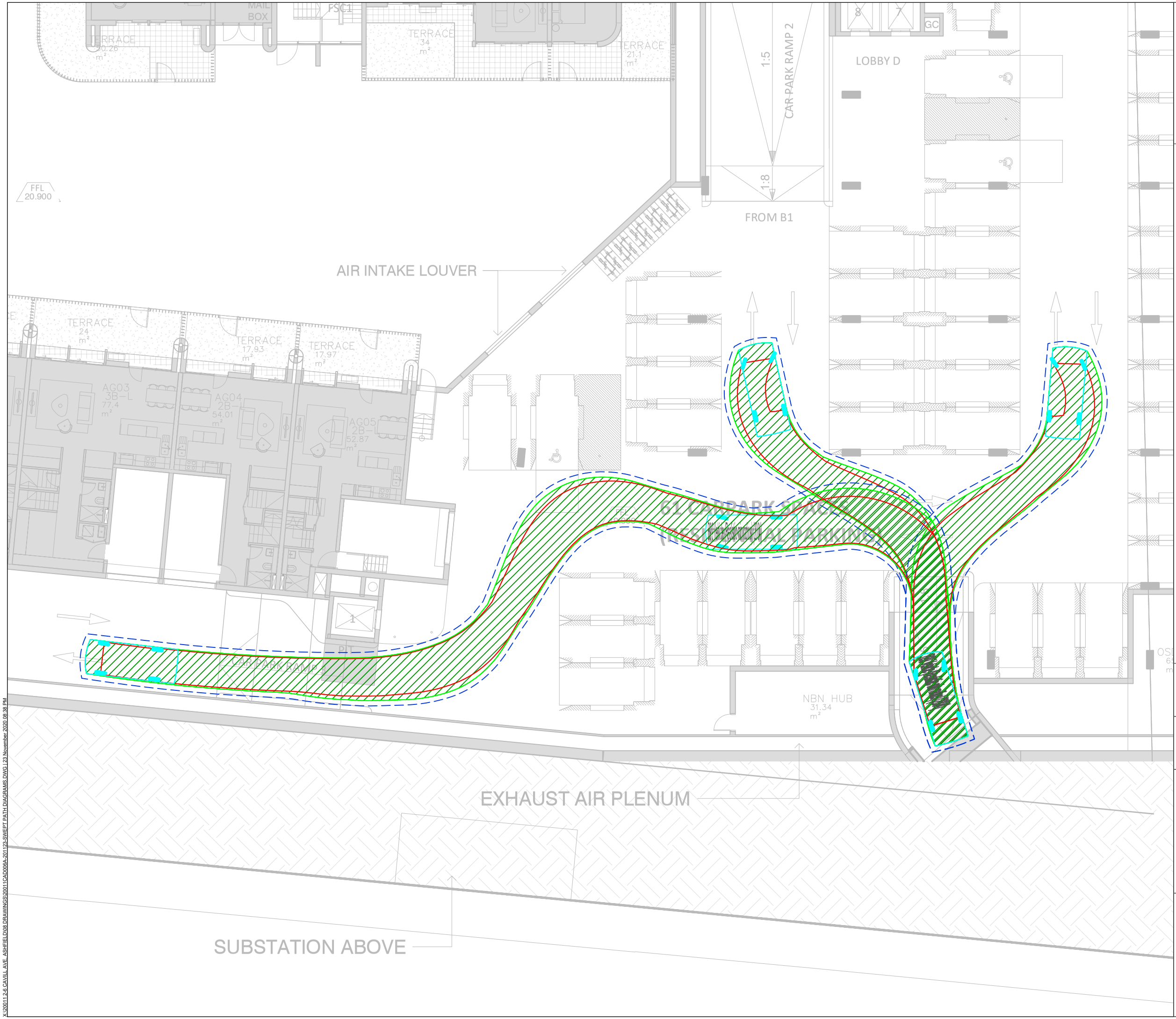
DRAWING TITLE:

SWEPT PATH ANALYSIS - AS2890.1 5.2M B99 VEHICLES ACCESSING CAVILL AVE DRIVEWAY

PROJECT:

2-6 CAVILL AVE, ASHFIELD

X:\20011 2-6 CAVILL AVE, ASHFIELD\08 DRAWINGS\20011CAD006A-20112\SWEPT PATH DIAGRAMS.DWG | 23 November 2020 08:38 PM

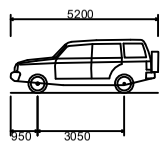


Transport Planning

Zenith Towers | Level 20 | Tower A | The Zenith
821 Pacific Highway | Chatswood | NSW | 2067

KEY:

	Forward	Reverse
Wheel Path		
Body Envelope		
Clearance (300mm)		



B99 Vehicle (Realistic min radius) (2004)

Overall Length	5200mm
Overall Width	1940mm
Overall Body Height	1878mm
Min Body Ground Clearance	272mm
Track Width	1840mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6250mm

DATE:	SCALE:
23 NOVEMBER 2020	1:200@A3
DRAWING NO.:	REV:
20011CAD006A-005	A

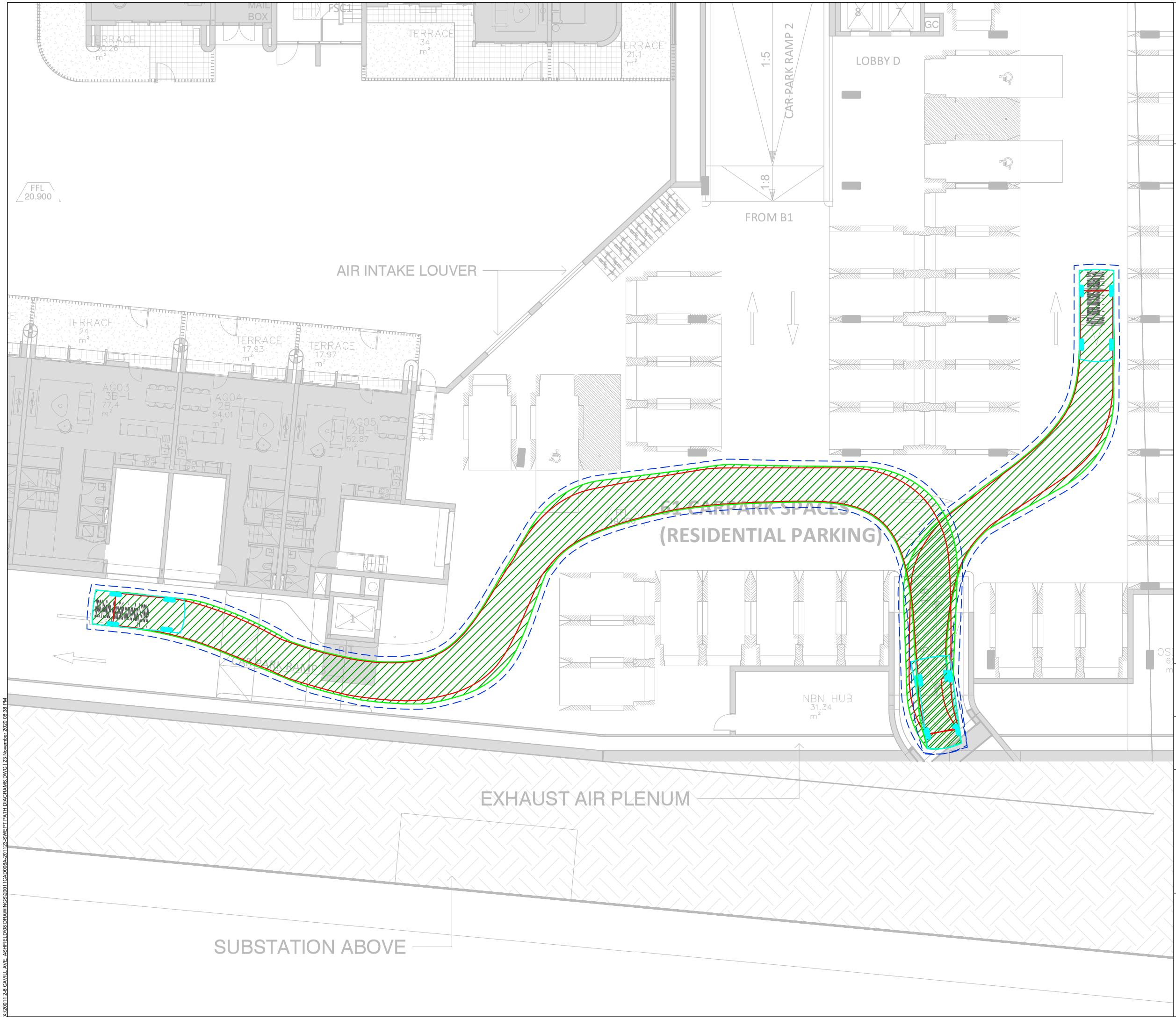
DRAWING TITLE:

SWEPT PATH ANALYSIS - AS2890.1 5.2M B99 VEHICLES ENTERING GROUND FLOOR FROM CAVILL AVE ACCESS

PROJECT:

2-6 CAVILL AVE, ASHFIELD

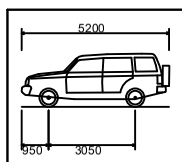
X:\20011 2-6 CAVILL AVE, ASHFIELD\08 DRAWINGS\20011CAD006A-201123-SWEPT PATH DIAGRAMS.DWG | 23 November 2020 08:38 PM



Transport Planning
Zenith Towers | Level 20 | Tower A | The Zenith
821 Pacific Highway | Chatswood | NSW | 2067

KEY:

	Forward	Reverse
Wheel Path		
Body Envelope		
Clearance (300mm)		



B99 Vehicle (Realistic min radius) (2004)

Overall Length	5200mm
Overall Width	1940mm
Overall Body Height	1878mm
Min Body Ground Clearance	272mm
Track Width	1840mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6250mm

DATE:	SCALE:
23 NOVEMBER 2020	1:200@A3
DRAWING NO.:	REV:
20011CAD006A-006	A

DRAWING TITLE:
SWEPT PATH ANALYSIS - AS2890.1 5.2M B99 VEHICLES EXITING GROUND FLOOR TO CAVILL AVE ACCESS

PROJECT:
2-6 CAVILL AVE, ASHFIELD

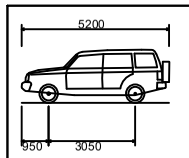
X:\20011 2-6 CAVILL AVE, ASHFIELD\08 DRAWINGS\20011CAD006A-20123-SWEPT PATH DIAGRAMS.DWG | 23 November 2020 09:38 PM

Transport Planning
Zenith Towers | Level 20 | Tower A | The Zenith
821 Pacific Highway | Chatswood | NSW | 2067

1:6
1:9
1:16
1:15
CAR PARK RAMP 1
FFL 17.850
FFL 17.000
FIRE WATER TANK 91.14 m²
E HYD UMP OOM .99
Plant Room S/A Riser
LOBBY B
LOBBY C
LOBBY A2
GC
CP E/A
VOID TO LOADING DOCK BELOW
STORAGE
BICYCLE PARKING
5800
6100

KEY:

	Forward	Reverse
Wheel Path		
Body Envelope		
Clearance (300mm)		



B99 Vehicle (Realistic min radius) (2004)

Overall Length	5200mm
Overall Width	1940mm
Overall Body Height	1878mm
Min Body Ground Clearance	272mm
Track Width	1840mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6250mm

DATE:	SCALE:
23 NOVEMBER 2020	1:200@A3
DRAWING NO.:	REV:
20011CAD006A-007	A

DRAWING TITLE:
SWEPT PATH ANALYSIS - AS2890.1 5.2M B99 VEHICLES ACCESS B1 CAR PARK FROM THOMAS ST ACCESS

PROJECT:
2-6 CAVILL AVE, ASHFIELD

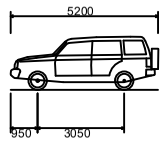
X:\20011 2-6 CAVILL AVE, ASHFIELD\08 DRAWINGS\20011CAD006A-201123-SWEPT PATH DIAGRAMS.DWG | 23 November 2020 08:38 PM

Transport Planning

Zenith Towers | Level 20 | Tower A | The Zenith
821 Pacific Highway | Chatswood | NSW | 2067

KEY:

	Forward	Reverse
Wheel Path		
Body Envelope		
Clearance (300mm)		



B99 Vehicle (Realistic min radius) (2004)

Overall Length	5200mm
Overall Width	1940mm
Overall Body Height	1878mm
Min Body Ground Clearance	272mm
Track Width	1840mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6250mm

DATE:	SCALE:
23 NOVEMBER 2020	1:200@A3

DRAWING NO.:	REV:
20011CAD006A-008	A

DRAWING TITLE:

SWEPT PATH ANALYSIS - AS2890.1 5.2M B99 VEHICLES ACCESS B2 CAR PARK FROM THOMAS ST ACCESS

PROJECT:

2-6 CAVILL AVE, ASHFIELD

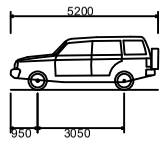
X:\20011 2-6 CAVILL AVE, ASHFIELD\06 DRAWINGS\20011CAD006A-201123-SWEPT PATH DIAGRAMS.DWG | 23 November 2020 08:38 PM

Transport Planning

Zenith Towers | Level 20 | Tower A | The Zenith
821 Pacific Highway | Chatswood | NSW | 2067

KEY:

	Forward	Reverse
Wheel Path		
Body Envelope		
Clearance (300mm)		



B99 Vehicle (Realistic min radius) (2004)

Overall Length	5200mm
Overall Width	1940mm
Overall Body Height	1878mm
Min Body Ground Clearance	272mm
Track Width	1840mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6250mm

DATE:	SCALE:
23 NOVEMBER 2020	1:200@A3

DRAWING NO.:	REV:
20011CAD006A-009	A

DRAWING TITLE:

SWEPT PATH ANALYSIS - AS2890.1 5.2M B99 VEHICLES ACCESS B2 CAR PARK FROM THOMAS ST ACCESS

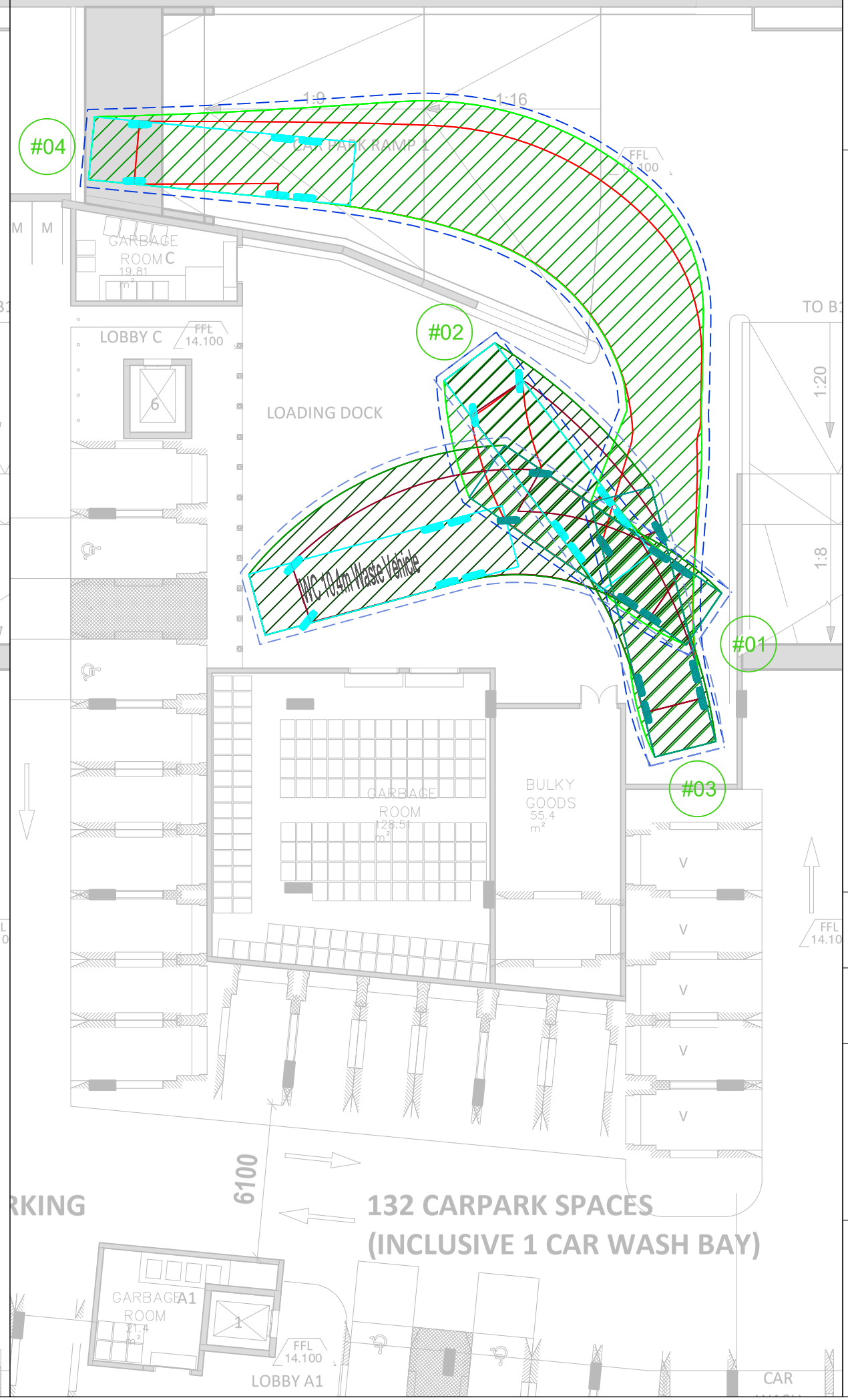
PROJECT:

2-6 CAVILL AVE, ASHFIELD

X:\20011 2-6 CAVILL AVE, ASHFIELD\06 DRAWINGS\20011CAD006A-201123-SWEPT PATH DIAGRAMS.DWG | 23 November 2020 08:38 PM

VEHICLE ENTERING

VEHICLE EXITING

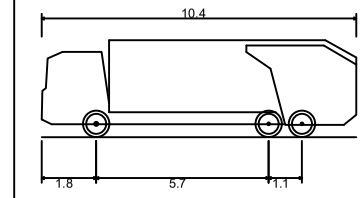


Transport Planning

Zenith Towers | Level 20 | Tower A | The Zenith
821 Pacific Highway | Chatswood | NSW | 2067

KEY:

	Forward	Reverse
Wheel Path		
Body Envelope		
Clearance (300mm)		



IWC 10.4m Waste Vehicle

Overall Length	10.400m
Overall Width	2.500m
Overall Body Height	3.206m
Min Body Ground Clearance	0.411m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	12.500m

DATE:	SCALE:
23 NOVEMBER 2020	1:200@A3
DRAWING NO.:	REV:
20011CAD006A-010	A

DRAWING TITLE:

SWEPT PATH ANALYSIS - COUNCIL 10.4M WASTE VEHICLE ACCESSING B2 LOADING DOCK

PROJECT:

2-6 CAVILL AVE, ASHFIELD

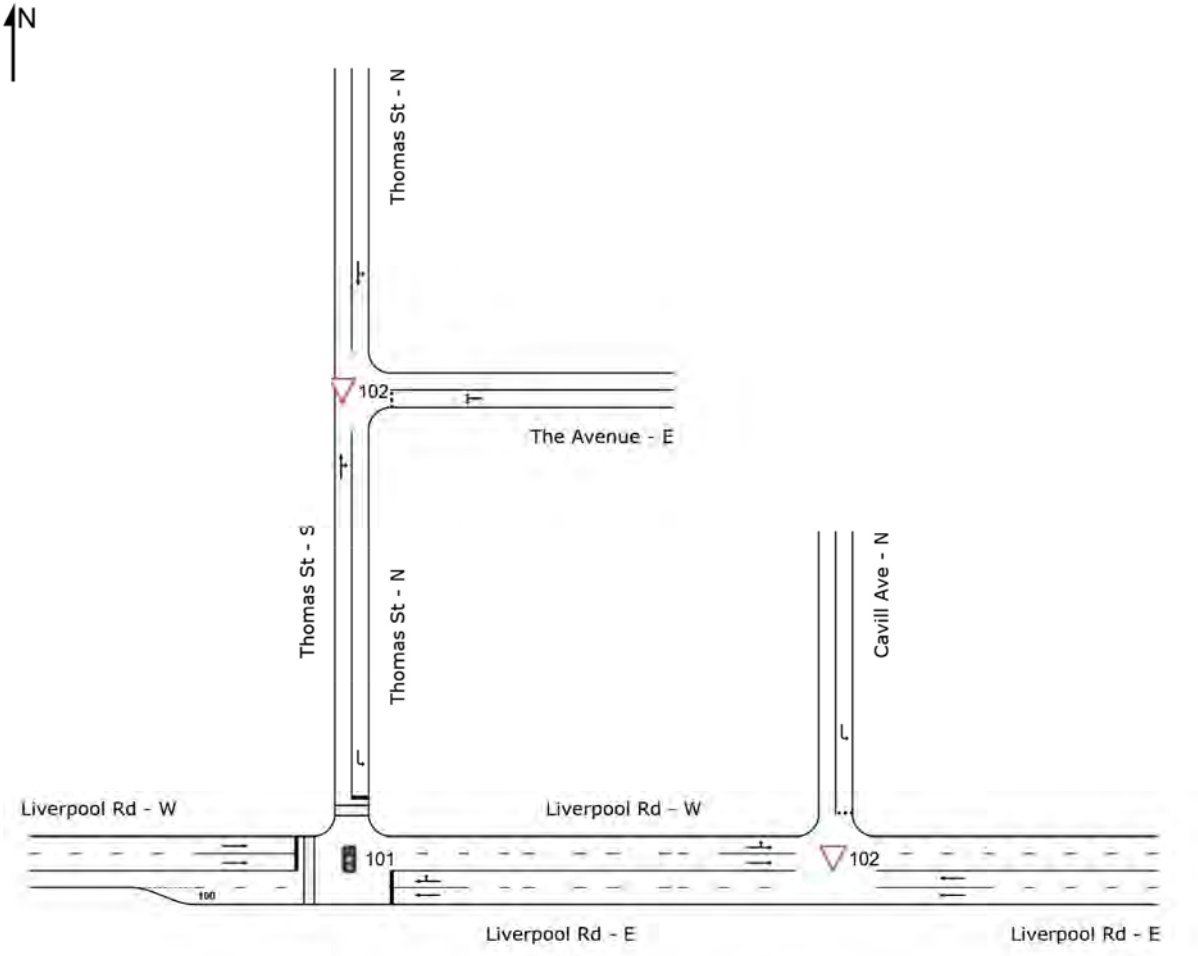
Appendix C

SIDRA Modelling Output

NETWORK LAYOUT

Network: N101 [Ashfield (Ex-AM)]

New Network
Network Category: (None)



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	Liverpool Rd / Thomas St (Ex-AM)
102	NA	The Avenue / Thomas St (Ex-AM)
102	NA	Liverpool Rd / Cavill Ave (Ex-AM)

MOVEMENT SUMMARY

Site: 102 [The Avenue / Thomas St (Ex-AM)]

Network: N101 [Ashfield (Ex-AM)]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Thomas St - S														
2	T1	241	3.0	241	3.0	0.131	0.0	LOS A	0.0	0.1	0.02	0.02	0.02	59.7
3	R2	6	3.0	6	3.0	0.131	6.4	LOS A	0.0	0.1	0.02	0.02	0.02	55.8
Approach		247	3.0	247	3.0	0.131	0.2	NA	0.0	0.1	0.02	0.02	0.02	59.6
East: The Avenue - E														
4	L2	28	3.0	28	3.0	0.054	6.4	LOS A	0.1	0.5	0.36	0.62	0.36	49.0
6	R2	25	3.0	25	3.0	0.054	7.4	LOS A	0.1	0.5	0.36	0.62	0.36	51.9
Approach		54	3.0	54	3.0	0.054	6.9	LOS A	0.1	0.5	0.36	0.62	0.36	50.8
North: Thomas St - N														
7	L2	7	3.0	7	3.0	0.139	5.6	LOS A	0.0	0.0	0.00	0.02	0.00	58.0
8	T1	243	3.0	243	3.0	0.139	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.7
Approach		251	3.0	251	3.0	0.139	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.6
All Vehicles		552	3.0	552	3.0	0.139	0.8	NA	0.1	0.5	0.04	0.08	0.04	58.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Thomas St / Liverpool Rd (Ex-AM)]

Network: N101 [Ashfield (Ex-AM)]

New Site
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 110 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: Liverpool Rd - E														
5	T1	579	5.0	579	5.0	0.686	2.4	LOS A	3.2	23.0	0.25	0.22	0.25	54.5
6	R2	247	3.0	247	3.0	0.686	46.7	LOS D	3.2	23.0	0.98	0.85	1.00	2.7
Approach		826	4.4	826	4.4	0.686	15.6	LOS B	3.2	23.0	0.47	0.41	0.47	31.4
North: Thomas St - N														
7	L2	272	3.0	272	3.0	0.714	50.0	LOS D	8.6	61.9	0.99	0.86	1.03	7.1
Approach		272	3.0	272	3.0	0.714	50.0	LOS D	8.6	61.9	0.99	0.86	1.03	7.1
West: Liverpool Rd - W														
11	T1	1168	5.0	1168	5.0	0.605	9.2	LOS A	13.6	99.6	0.54	0.49	0.54	42.5
Approach		1168	5.0	1168	5.0	0.605	9.2	LOS A	13.6	99.6	0.54	0.49	0.54	42.5
All Vehicles		2266	4.5	2266	4.5	0.714	16.4	LOS B	13.6	99.6	0.56	0.50	0.57	31.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P3	North Full Crossing	226	49.6	LOS E	0.7	0.7	0.95	0.95
P4	West Full Crossing	211	49.6	LOS E	0.6	0.6	0.95	0.95
All Pedestrians		437	49.6	LOS E			0.95	0.95

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 102 [Liverpool Rd / Cavill Ave (Ex-AM)]

Network: N101 [Ashfield (Ex-AM)]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: Liverpool Rd - E														
2	T1	826	5.0	826	5.0	0.219	0.0	LOS A	4.7	34.2	0.00	0.00	0.00	60.0
Approach		826	5.0	826	5.0	0.219	0.0	NA	4.7	34.2	0.00	0.00	0.00	60.0
North: Cavill Ave - N														
4	L2	78	3.0	78	3.0	0.120	8.8	LOS A	0.2	1.4	0.57	0.76	0.57	42.0
Approach		78	3.0	78	3.0	0.120	8.8	LOS A	0.2	1.4	0.57	0.76	0.57	42.0
West: Liverpool Rd - W														
7	L2	54	3.0	54	3.0	0.382	2.8	LOS A	0.0	0.0	0.00	0.04	0.00	56.3
8	T1	1385	5.0	1385	5.0	0.382	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.3
Approach		1439	4.9	1439	4.9	0.382	0.1	NA	0.0	0.0	0.00	0.02	0.00	59.0
All Vehicles		2343	4.9	2343	4.9	0.382	0.4	NA	4.7	34.2	0.02	0.04	0.02	56.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [The Avenue / Thomas St (Ex-PM)]

Network: N101 [Ashfield (Ex-PM)]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Thomas St - S														
2	T1	437	3.0	437	3.0	0.255	0.1	LOS A	0.1	0.8	0.06	0.05	0.06	59.0
3	R2	35	3.0	35	3.0	0.255	6.7	LOS A	0.1	0.8	0.06	0.05	0.06	55.2
Approach		472	3.0	472	3.0	0.255	0.6	NA	0.1	0.8	0.06	0.05	0.06	58.7
East: The Avenue - E														
4	L2	5	3.0	5	3.0	0.017	6.4	LOS A	0.0	0.2	0.42	0.64	0.42	47.8
6	R2	8	3.0	8	3.0	0.017	8.8	LOS A	0.0	0.2	0.42	0.64	0.42	51.2
Approach		14	3.0	14	3.0	0.017	7.9	LOS A	0.0	0.2	0.42	0.64	0.42	50.4
North: Thomas St - N														
7	L2	19	3.0	19	3.0	0.146	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	57.8
8	T1	260	3.0	260	3.0	0.146	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	59.2
Approach		279	3.0	279	3.0	0.146	0.4	NA	0.0	0.0	0.00	0.04	0.00	59.1
All Vehicles		764	3.0	764	3.0	0.255	0.7	NA	0.1	0.8	0.04	0.05	0.04	58.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Thomas St / Liverpool Rd (Ex-PM)]

Network: N101 [Ashfield (Ex-PM)]

New Site
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 60 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: Liverpool Rd - E														
5	T1	929	5.0	929	5.0	0.656	4.0	LOS A	3.2	23.0	0.53	0.49	0.53	51.3
6	R2	471	3.0	471	3.0	0.739	23.4	LOS B	3.2	23.0	0.94	0.88	1.03	5.1
Approach		1400	4.3	1400	4.3	0.739	10.5	LOS A	3.2	23.0	0.67	0.62	0.70	36.6
North: Thomas St - N														
7	L2	265	3.0	265	3.0	0.417	20.9	LOS B	3.7	26.6	0.81	0.78	0.81	14.2
Approach		265	3.0	265	3.0	0.417	20.9	LOS B	3.7	26.6	0.81	0.78	0.81	14.2
West: Liverpool Rd - W														
11	T1	717	5.0	717	5.0	0.562	12.6	LOS A	6.4	46.8	0.75	0.65	0.75	38.3
Approach		717	5.0	717	5.0	0.562	12.6	LOS A	6.4	46.8	0.75	0.65	0.75	38.3
All Vehicles		2382	4.4	2382	4.4	0.739	12.3	LOS A	6.4	46.8	0.71	0.65	0.73	34.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P3	North Full Crossing	311	24.6	LOS C	0.5	0.5	0.91	0.91
P4	West Full Crossing	211	24.5	LOS C	0.3	0.3	0.91	0.91
All Pedestrians		521	24.6	LOS C			0.91	0.91

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 102 [Liverpool Rd / Cavill Ave (Ex-PM)]

Network: N101 [Ashfield (Ex-PM)]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

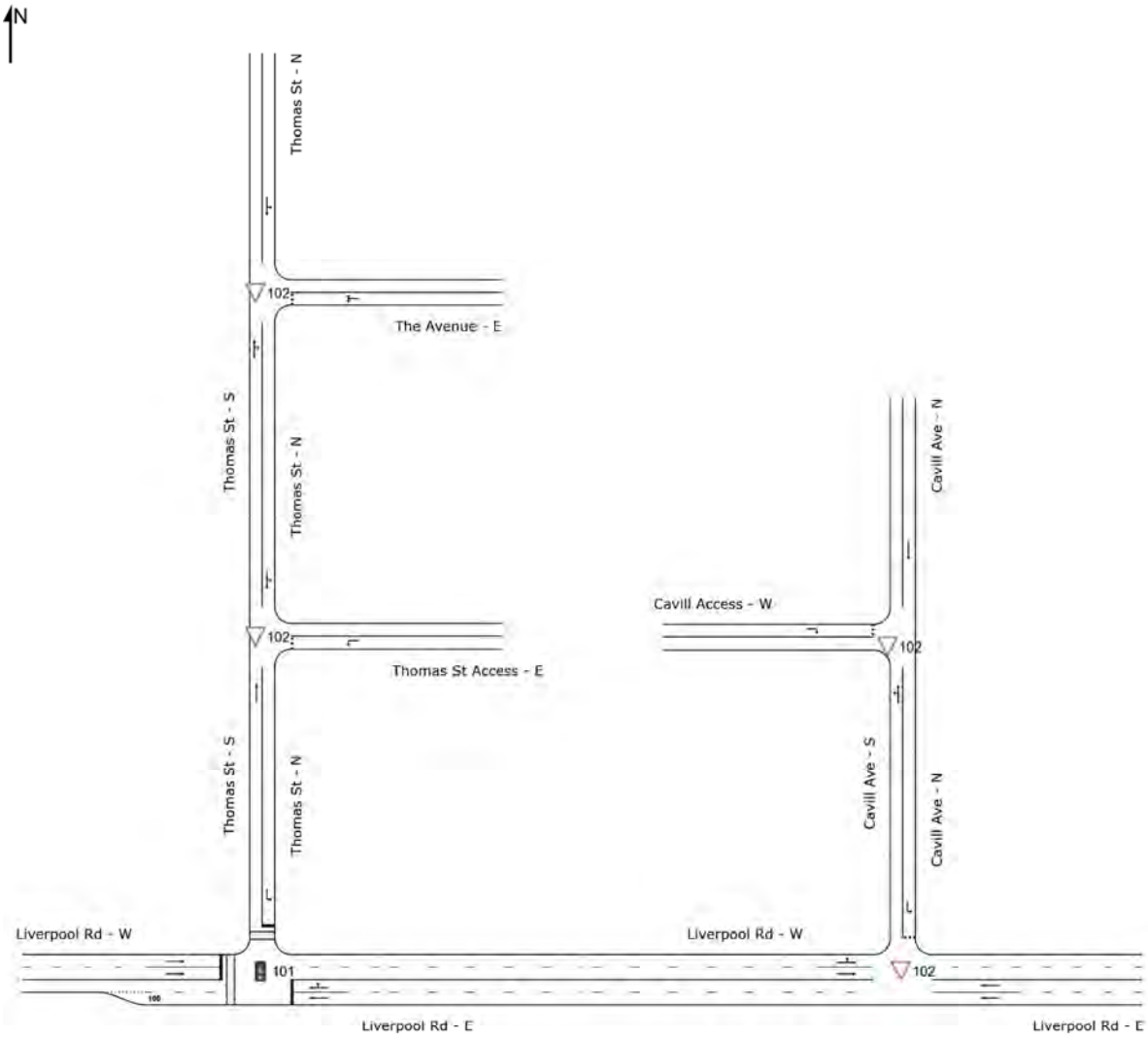
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: Liverpool Rd - E														
2	T1	1400	5.0	1400	5.0	0.371	0.0	LOS A	5.1	36.9	0.00	0.00	0.00	59.9
Approach		1400	5.0	1400	5.0	0.371	0.0	NA	5.1	36.9	0.00	0.00	0.00	59.9
North: Cavill Ave - N														
4	L2	104	3.0	104	3.0	0.122	7.0	LOS A	0.2	1.5	0.48	0.65	0.48	43.3
Approach		104	3.0	104	3.0	0.122	7.0	LOS A	0.2	1.5	0.48	0.65	0.48	43.3
West: Liverpool Rd - W														
7	L2	33	3.0	33	3.0	0.260	2.8	LOS A	0.0	0.0	0.00	0.04	0.00	56.3
8	T1	948	5.0	948	5.0	0.260	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.4
Approach		981	4.9	981	4.9	0.260	0.1	NA	0.0	0.0	0.00	0.02	0.00	59.1
All Vehicles		2485	4.9	2485	4.9	0.371	0.3	NA	5.1	36.9	0.02	0.03	0.02	56.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

NETWORK LAYOUT

Network: N101 [Ashfield (Dev & Cavill-AM)]

New Network
Network Category: (None)



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	Liverpool Rd / Thomas St (Dev & Cavill-AM)
102	NA	The Avenue / Thomas St (Dev & Cavill-AM)
102	NA	Thomas St Access (Dev & Cavill-AM)
102	NA	Liverpool Rd / Cavill Ave (Dev & Cavill-AM)
102	NA	Cavill Ave Access (Dev & Cavill-AM)

MOVEMENT SUMMARY

Site: 102 [The Avenue / Thomas St (Dev & Cavill-AM)]

Network: N101 [Ashfield (Dev & Cavill-AM)]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Thomas St - S														
2	T1	241	3.0	241	3.0	0.131	0.0	LOS A	0.0	0.2	0.02	0.02	0.02	59.6
3	R2	6	3.0	6	3.0	0.131	5.7	LOS A	0.0	0.2	0.02	0.02	0.02	55.6
Approach		247	3.0	247	3.0	0.131	0.2	NA	0.0	0.2	0.02	0.02	0.02	59.5
East: The Avenue - E														
4	L2	28	3.0	28	3.0	0.055	6.4	LOS A	0.1	0.6	0.37	0.63	0.37	48.9
6	R2	25	3.0	25	3.0	0.055	7.8	LOS A	0.1	0.6	0.37	0.63	0.37	51.8
Approach		54	3.0	54	3.0	0.055	7.1	LOS A	0.1	0.6	0.37	0.63	0.37	50.7
North: Thomas St - N														
7	L2	7	3.0	7	3.0	0.138	5.6	LOS A	0.0	0.0	0.00	0.02	0.00	58.0
8	T1	256	3.0	256	3.0	0.138	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.7
Approach		263	3.0	263	3.0	0.138	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.6
All Vehicles		564	3.0	564	3.0	0.138	0.8	NA	0.1	0.6	0.05	0.07	0.05	58.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Thomas St Access (Dev & Cavill-AM)]

Network: N101 [Ashfield (Dev & Cavill-AM)]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Thomas St - S														
2	T1	247	3.0	247	3.0	0.129	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		247	3.0	247	3.0	0.129	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
East: Thomas St Access - E														
4	L2	21	3.0	21	3.0	0.034	6.5	LOS A	0.0	0.2	0.34	0.58	0.34	49.0
Approach		21	3.0	21	3.0	0.034	6.5	LOS A	0.0	0.2	0.34	0.58	0.34	49.0
North: Thomas St - N														
7	L2	13	3.0	13	3.0	0.149	4.7	LOS A	5.1	36.5	0.00	0.03	0.00	56.6
8	T1	272	3.0	272	3.0	0.149	0.0	LOS A	5.1	36.5	0.00	0.03	0.00	57.5
Approach		284	3.0	284	3.0	0.149	0.2	NA	5.1	36.5	0.00	0.03	0.00	57.2
All Vehicles		553	3.0	553	3.0	0.149	0.4	NA	5.1	36.5	0.01	0.04	0.01	55.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Thomas St / Liverpool Rd (Dev & Cavill-AM)]

Network: N101 [Ashfield (Dev & Cavill-AM)]

New Site
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 110 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: Liverpool Rd - E														
5	T1	579	5.0	579	5.0	0.686	2.4	LOS A	3.2	23.0	0.25	0.22	0.25	54.5
6	R2	247	3.0	247	3.0	0.686	46.7	LOS D	3.2	23.0	0.98	0.85	1.00	2.7
Approach		826	4.4	826	4.4	0.686	15.6	LOS B	3.2	23.0	0.47	0.41	0.47	31.4
North: Thomas St - N														
7	L2	293	3.0	293	3.0	0.770	50.6	LOS D	4.2	30.0	1.00	0.89	1.10	3.1
Approach		293	3.0	293	3.0	0.770	50.6	LOS D	4.2	30.0	1.00	0.89	1.10	3.1
West: Liverpool Rd - W														
11	T1	1168	5.0	1168	5.0	0.605	9.2	LOS A	13.6	99.6	0.54	0.49	0.54	42.5
Approach		1168	5.0	1168	5.0	0.605	9.2	LOS A	13.6	99.6	0.54	0.49	0.54	42.5
All Vehicles		2287	4.5	2287	4.5	0.770	16.8	LOS B	13.6	99.6	0.57	0.51	0.58	30.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P3	North Full Crossing	226	49.6	LOS E	0.7	0.7	0.95	0.95
P4	West Full Crossing	211	49.6	LOS E	0.6	0.6	0.95	0.95
All Pedestrians		437	49.6	LOS E			0.95	0.95

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 102 [Liverpool Rd / Cavill Ave (Dev & Cavill-AM)]

Network: N101 [Ashfield (Dev & Cavill-AM)]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: Liverpool Rd - E														
2	T1	826	5.0	826	5.0	0.219	0.0	LOS A	4.7	34.2	0.00	0.00	0.00	60.0
Approach		826	5.0	826	5.0	0.219	0.0	NA	4.7	34.2	0.00	0.00	0.00	60.0
North: Cavill Ave - N														
4	L2	99	3.0	99	3.0	0.155	7.0	LOS A	0.2	1.8	0.59	0.77	0.59	31.9
Approach		99	3.0	99	3.0	0.155	7.0	LOS A	0.2	1.8	0.59	0.77	0.59	31.9
West: Liverpool Rd - W														
7	L2	54	3.0	54	3.0	0.387	2.8	LOS A	0.0	0.0	0.00	0.04	0.00	54.2
8	T1	1406	5.0	1406	5.0	0.387	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.3
Approach		1460	4.9	1460	4.9	0.387	0.1	NA	0.0	0.0	0.00	0.02	0.00	59.3
All Vehicles		2385	4.9	2385	4.9	0.387	0.4	NA	4.7	34.2	0.02	0.04	0.02	57.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Cavill Ave Access (Dev & Cavill-AM)]

Network: N101 [Ashfield (Dev & Cavill-AM)]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Cavill Ave - S														
7	L2	1	3.0	1	3.0	0.025	2.7	LOS A	0.0	0.0	0.00	0.01	0.00	56.6
8	T1	47	3.0	47	3.0	0.025	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.5
Approach		48	3.0	48	3.0	0.025	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.2
North: Cavill Ave - N														
2	T1	78	3.0	78	3.0	0.041	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		78	3.0	78	3.0	0.041	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
West: Cavill Access - W														
6	R2	21	3.0	21	3.0	0.019	5.0	LOS A	0.0	0.2	0.20	0.54	0.20	43.7
Approach		21	3.0	21	3.0	0.019	5.0	LOS A	0.0	0.2	0.20	0.54	0.20	43.7
All Vehicles		147	3.0	147	3.0	0.041	0.7	NA	0.0	0.2	0.03	0.08	0.03	51.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [The Avenue / Thomas St (Dev & Cavill-PM)]

Network: N101 [Ashfield (Dev & Cavill-PM)]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Thomas St - S														
2	T1	437	3.0	437	3.0	0.256	0.2	LOS A	0.1	1.0	0.09	0.05	0.09	58.9
3	R2	35	3.0	35	3.0	0.256	6.1	LOS A	0.1	1.0	0.09	0.05	0.09	54.9
Approach		472	3.0	472	3.0	0.256	0.6	NA	0.1	1.0	0.09	0.05	0.09	58.6
East: The Avenue - E														
4	L2	5	3.0	5	3.0	0.019	6.5	LOS A	0.0	0.2	0.45	0.67	0.45	47.1
6	R2	8	3.0	8	3.0	0.019	9.7	LOS A	0.0	0.2	0.45	0.67	0.45	50.8
Approach		14	3.0	14	3.0	0.019	8.5	LOS A	0.0	0.2	0.45	0.67	0.45	49.8
North: Thomas St - N														
7	L2	19	3.0	19	3.0	0.164	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	57.9
8	T1	294	3.0	294	3.0	0.164	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	59.3
Approach		313	3.0	313	3.0	0.164	0.4	NA	0.0	0.0	0.00	0.04	0.00	59.2
All Vehicles		798	3.0	798	3.0	0.256	0.6	NA	0.1	1.0	0.06	0.05	0.06	58.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Thomas St Access (Dev & Cavill-PM)]

Network: N101 [Ashfield (Dev & Cavill-PM)]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Thomas St - S														
2	T1	472	3.0	472	3.0	0.247	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		472	3.0	472	3.0	0.247	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
East: Thomas St Access - E														
4	L2	11	3.0	11	3.0	0.017	6.5	LOS A	0.0	0.1	0.34	0.57	0.34	49.0
Approach		11	3.0	11	3.0	0.017	6.5	LOS A	0.0	0.1	0.34	0.57	0.34	49.0
North: Thomas St - N														
7	L2	17	3.0	17	3.0	0.303	4.7	LOS A	0.0	0.0	0.00	0.03	0.00	56.4
8	T1	282	3.0	282	3.0	0.303	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	56.7
Approach		299	3.0	299	3.0	0.303	0.3	NA	0.0	0.0	0.00	0.03	0.00	56.6
All Vehicles		781	3.0	781	3.0	0.303	0.2	NA	0.0	0.1	0.00	0.02	0.00	56.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Thomas St / Liverpool Rd (Dev & Cavill-PM)]

Network: N101 [Ashfield (Dev & Cavill-PM)]

New Site
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 60 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: Liverpool Rd - E														
5	T1	929	5.0	929	5.0	0.656	4.0	LOS A	3.2	23.0	0.53	0.49	0.53	51.3
6	R2	471	3.0	471	3.0	0.739	23.4	LOS B	3.2	23.0	0.94	0.88	1.03	5.1
Approach		1400	4.3	1400	4.3	0.739	10.5	LOS A	3.2	23.0	0.67	0.62	0.70	36.6
North: Thomas St - N														
7	L2	293	3.0	293	3.0	0.460	19.6	LOS B	4.2	29.9	0.82	0.78	0.82	7.2
Approach		293	3.0	293	3.0	0.460	19.6	LOS B	4.2	29.9	0.82	0.78	0.82	7.2
West: Liverpool Rd - W														
11	T1	717	5.0	717	5.0	0.562	12.6	LOS A	6.4	46.8	0.75	0.65	0.75	38.3
Approach		717	5.0	717	5.0	0.562	12.6	LOS A	6.4	46.8	0.75	0.65	0.75	38.3
All Vehicles		2409	4.4	2409	4.4	0.739	12.2	LOS A	6.4	46.8	0.71	0.65	0.73	34.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P3	North Full Crossing	311	24.6	LOS C	0.5	0.5	0.91	0.91
P4	West Full Crossing	211	24.5	LOS C	0.3	0.3	0.91	0.91
All Pedestrians		521	24.6	LOS C			0.91	0.91

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 102 [Liverpool Rd / Cavill Ave (Dev & Cavill-PM)]

Network: N101 [Ashfield (Dev & Cavill-PM)]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: Liverpool Rd - E														
2	T1	1400	5.0	1400	5.0	0.371	0.0	LOS A	5.1	36.9	0.00	0.00	0.00	59.9
Approach		1400	5.0	1400	5.0	0.371	0.0	NA	5.1	36.9	0.00	0.00	0.00	59.9
North: Cavill Ave - N														
4	L2	104	3.0	104	3.0	0.122	5.0	LOS A	0.2	1.5	0.48	0.63	0.48	35.4
Approach		104	3.0	104	3.0	0.122	5.0	LOS A	0.2	1.5	0.48	0.63	0.48	35.4
West: Liverpool Rd - W														
7	L2	49	3.0	49	3.0	0.267	2.8	LOS A	0.0	0.0	0.00	0.05	0.00	52.6
8	T1	959	5.0	959	5.0	0.267	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.2
Approach		1008	4.9	1008	4.9	0.267	0.1	NA	0.0	0.0	0.00	0.03	0.00	59.1
All Vehicles		2513	4.9	2513	4.9	0.371	0.3	NA	5.1	36.9	0.02	0.04	0.02	57.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Cavill Ave Access (Dev & Cavill-PM)]

Network: N101 [Ashfield (Dev & Cavill-PM)]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

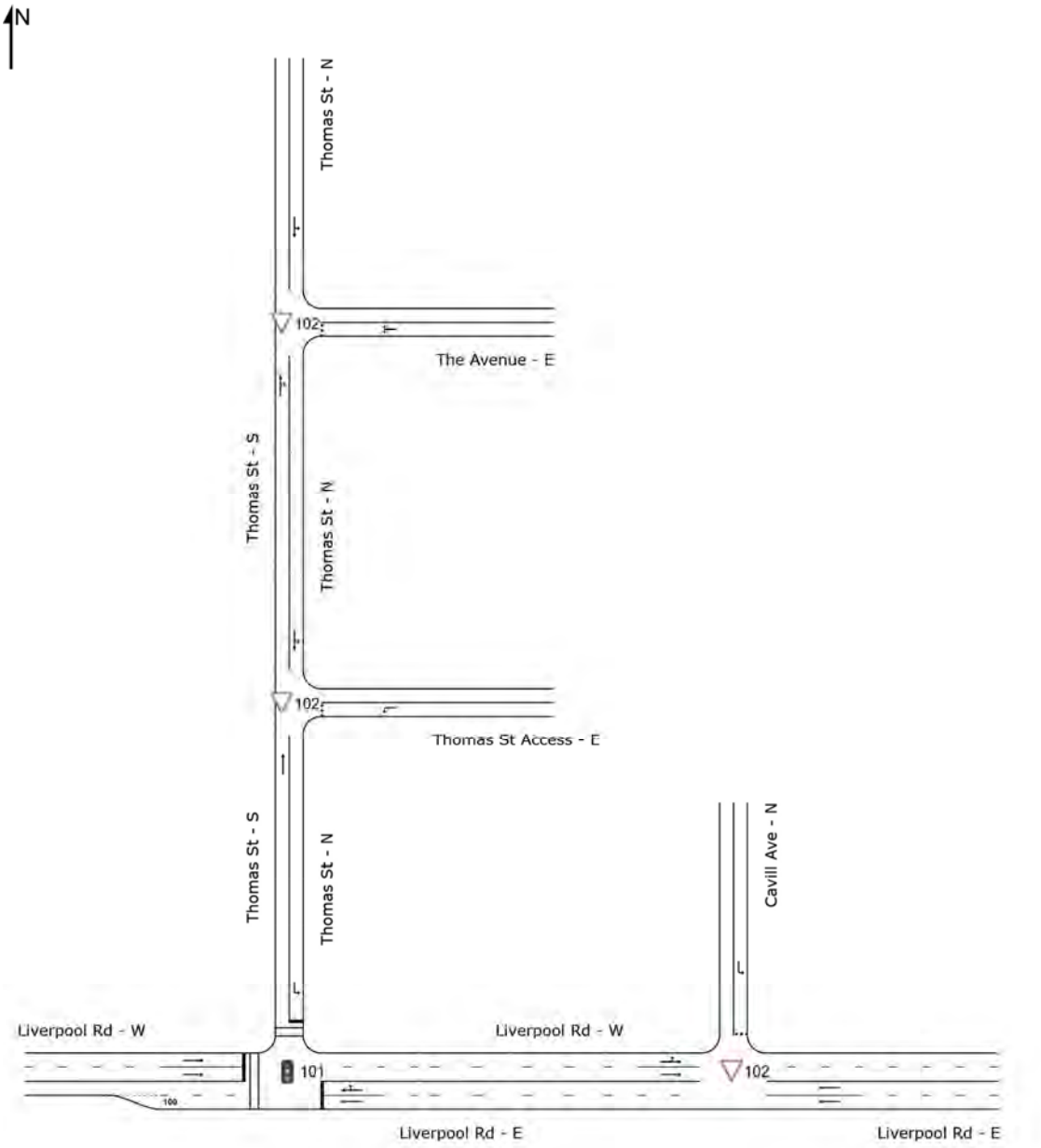
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Cavill Ave - S														
7	L2	17	3.0	17	3.0	0.020	2.7	LOS A	0.0	0.0	0.00	0.24	0.00	54.8
8	T1	21	3.0	21	3.0	0.020	0.0	LOS A	0.0	0.0	0.00	0.24	0.00	51.0
Approach		38	3.0	38	3.0	0.020	1.2	NA	0.0	0.0	0.00	0.24	0.00	53.9
North: Cavill Ave - N														
2	T1	104	3.0	104	3.0	0.054	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		104	3.0	104	3.0	0.054	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
West: Cavill Access - W														
6	R2	1	3.0	1	3.0	0.001	5.0	LOS A	0.0	0.0	0.20	0.51	0.20	43.7
Approach		1	3.0	1	3.0	0.001	5.0	LOS A	0.0	0.0	0.20	0.51	0.20	43.7
All Vehicles		143	3.0	143	3.0	0.054	0.4	NA	0.0	0.0	0.00	0.07	0.00	56.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

NETWORK LAYOUT

Network: N101 [Ashfield (Dev-AM)]

New Network
Network Category: (None)



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	Liverpool Rd / Thomas St (Dev-AM)
102	NA	The Avenue / Thomas St (Dev-AM)
102	NA	Thomas St Access (Dev-AM)
102	NA	Liverpool Rd / Cavill Ave (Dev-AM)

MOVEMENT SUMMARY

Site: 102 [The Avenue / Thomas St (Dev-AM)]

Network: N101 [Ashfield (Dev-AM)]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Thomas St - S														
2	T1	241	3.0	241	3.0	0.131	0.0	LOS A	0.0	0.2	0.02	0.02	0.02	59.6
3	R2	6	3.0	6	3.0	0.131	5.7	LOS A	0.0	0.2	0.02	0.02	0.02	55.6
Approach		247	3.0	247	3.0	0.131	0.2	NA	0.0	0.2	0.02	0.02	0.02	59.5
East: The Avenue - E														
4	L2	28	3.0	28	3.0	0.055	6.4	LOS A	0.1	0.6	0.37	0.63	0.37	48.9
6	R2	25	3.0	25	3.0	0.055	7.8	LOS A	0.1	0.6	0.37	0.63	0.37	51.8
Approach		54	3.0	54	3.0	0.055	7.1	LOS A	0.1	0.6	0.37	0.63	0.37	50.7
North: Thomas St - N														
7	L2	7	3.0	7	3.0	0.138	5.6	LOS A	0.0	0.0	0.00	0.02	0.00	58.0
8	T1	256	3.0	256	3.0	0.138	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.7
Approach		263	3.0	263	3.0	0.138	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.6
All Vehicles		564	3.0	564	3.0	0.138	0.8	NA	0.1	0.6	0.05	0.07	0.05	58.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Thomas St Access (Dev-AM)]

Network: N101 [Ashfield (Dev-AM)]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Thomas St - S														
2	T1	247	3.0	247	3.0	0.129	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		247	3.0	247	3.0	0.129	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
East: Thomas St Access - E														
4	L2	42	3.0	42	3.0	0.067	6.5	LOS A	0.1	0.4	0.34	0.59	0.34	49.0
Approach		42	3.0	42	3.0	0.067	6.5	LOS A	0.1	0.4	0.34	0.59	0.34	49.0
North: Thomas St - N														
7	L2	13	3.0	13	3.0	0.149	4.7	LOS A	5.8	41.6	0.00	0.03	0.00	56.6
8	T1	272	3.0	272	3.0	0.149	0.0	LOS A	5.8	41.6	0.00	0.03	0.00	57.5
Approach		284	3.0	284	3.0	0.149	0.2	NA	5.8	41.6	0.00	0.03	0.00	57.2
All Vehicles		574	3.0	574	3.0	0.149	0.6	NA	5.8	41.6	0.03	0.06	0.03	54.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Thomas St / Liverpool Rd (Dev-AM)]

Network: N101 [Ashfield (Dev-AM)]

New Site
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 110 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: Liverpool Rd - E														
5	T1	579	5.0	579	5.0	0.686	2.4	LOS A	3.2	23.0	0.25	0.22	0.25	54.5
6	R2	247	3.0	247	3.0	0.686	46.7	LOS D	3.2	23.0	0.98	0.85	1.00	2.7
Approach		826	4.4	826	4.4	0.686	15.6	LOS B	3.2	23.0	0.47	0.41	0.47	31.4
North: Thomas St - N														
7	L2	314	3.0	314	3.0	0.825	54.0	LOS D	4.2	30.0	1.00	0.93	1.17	2.9
Approach		314	3.0	314	3.0	0.825	54.0	LOS D	4.2	30.0	1.00	0.93	1.17	2.9
West: Liverpool Rd - W														
11	T1	1168	5.0	1168	5.0	0.605	9.2	LOS A	13.6	99.6	0.54	0.49	0.54	42.5
Approach		1168	5.0	1168	5.0	0.605	9.2	LOS A	13.6	99.6	0.54	0.49	0.54	42.5
All Vehicles		2308	4.5	2308	4.5	0.825	17.6	LOS B	13.6	99.6	0.57	0.52	0.60	30.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P3	North Full Crossing	226	49.6	LOS E	0.7	0.7	0.95	0.95
P4	West Full Crossing	211	49.6	LOS E	0.6	0.6	0.95	0.95
All Pedestrians		437	49.6	LOS E			0.95	0.95

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 102 [Liverpool Rd / Cavill Ave (Dev-AM)]

Network: N101 [Ashfield (Dev-AM)]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: Liverpool Rd - E														
2	T1	826	5.0	826	5.0	0.219	0.0	LOS A	4.7	34.2	0.00	0.00	0.00	60.0
Approach		826	5.0	826	5.0	0.219	0.0	NA	4.7	34.2	0.00	0.00	0.00	60.0
North: Cavill Ave - N														
4	L2	78	3.0	78	3.0	0.124	9.0	LOS A	0.2	1.4	0.58	0.77	0.58	41.8
Approach		78	3.0	78	3.0	0.124	9.0	LOS A	0.2	1.4	0.58	0.77	0.58	41.8
West: Liverpool Rd - W														
7	L2	54	3.0	54	3.0	0.393	2.8	LOS A	0.0	0.0	0.00	0.04	0.00	56.3
8	T1	1428	5.0	1428	5.0	0.393	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.3
Approach		1482	4.9	1482	4.9	0.393	0.1	NA	0.0	0.0	0.00	0.02	0.00	59.0
All Vehicles		2386	4.9	2386	4.9	0.393	0.4	NA	4.7	34.2	0.02	0.04	0.02	56.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [The Avenue / Thomas St (Dev-PM)]

Network: N101 [Ashfield (Dev-PM)]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Thomas St - S														
2	T1	437	3.0	437	3.0	0.256	0.2	LOS A	0.1	1.0	0.09	0.05	0.09	58.9
3	R2	35	3.0	35	3.0	0.256	6.1	LOS A	0.1	1.0	0.09	0.05	0.09	54.9
Approach		472	3.0	472	3.0	0.256	0.6	NA	0.1	1.0	0.09	0.05	0.09	58.6
East: The Avenue - E														
4	L2	5	3.0	5	3.0	0.019	6.5	LOS A	0.0	0.2	0.45	0.67	0.45	47.1
6	R2	8	3.0	8	3.0	0.019	9.7	LOS A	0.0	0.2	0.45	0.67	0.45	50.8
Approach		14	3.0	14	3.0	0.019	8.5	LOS A	0.0	0.2	0.45	0.67	0.45	49.8
North: Thomas St - N														
7	L2	19	3.0	19	3.0	0.164	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	57.9
8	T1	294	3.0	294	3.0	0.164	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	59.3
Approach		313	3.0	313	3.0	0.164	0.4	NA	0.0	0.0	0.00	0.04	0.00	59.2
All Vehicles		798	3.0	798	3.0	0.256	0.6	NA	0.1	1.0	0.06	0.05	0.06	58.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Thomas St Access (Dev-PM)]

Network: N101 [Ashfield (Dev-PM)]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Thomas St - S														
2	T1	472	3.0	472	3.0	0.247	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		472	3.0	472	3.0	0.247	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
East: Thomas St Access - E														
4	L2	11	3.0	11	3.0	0.015	6.4	LOS A	0.0	0.1	0.33	0.56	0.33	49.1
Approach		11	3.0	11	3.0	0.015	6.4	LOS A	0.0	0.1	0.33	0.56	0.33	49.1
North: Thomas St - N														
7	L2	34	3.0	34	3.0	0.263	4.7	LOS A	0.0	0.0	0.00	0.07	0.00	56.1
8	T1	265	3.0	265	3.0	0.263	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	54.0
Approach		299	3.0	299	3.0	0.263	0.5	NA	0.0	0.0	0.00	0.07	0.00	54.9
All Vehicles		781	3.0	781	3.0	0.263	0.3	NA	0.0	0.1	0.00	0.03	0.00	55.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Thomas St / Liverpool Rd (Dev-PM)]

Network: N101 [Ashfield (Dev-PM)]

New Site
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 60 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: Liverpool Rd - E														
5	T1	929	5.0	929	5.0	0.656	4.0	LOS A	3.2	23.0	0.53	0.49	0.53	51.3
6	R2	471	3.0	471	3.0	0.739	23.4	LOS B	3.2	23.0	0.94	0.88	1.03	5.1
Approach		1400	4.3	1400	4.3	0.739	10.5	LOS A	3.2	23.0	0.67	0.62	0.70	36.6
North: Thomas St - N														
7	L2	276	3.0	276	3.0	0.433	19.4	LOS B	3.9	27.9	0.81	0.78	0.81	7.2
Approach		276	3.0	276	3.0	0.433	19.4	LOS B	3.9	27.9	0.81	0.78	0.81	7.2
West: Liverpool Rd - W														
11	T1	717	5.0	717	5.0	0.562	12.6	LOS A	6.4	46.8	0.75	0.65	0.75	38.3
Approach		717	5.0	717	5.0	0.562	12.6	LOS A	6.4	46.8	0.75	0.65	0.75	38.3
All Vehicles		2393	4.4	2393	4.4	0.739	12.2	LOS A	6.4	46.8	0.71	0.65	0.73	34.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P3	North Full Crossing	311	24.6	LOS C	0.5	0.5	0.91	0.91
P4	West Full Crossing	211	24.5	LOS C	0.3	0.3	0.91	0.91
All Pedestrians		521	24.6	LOS C			0.91	0.91

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 102 [Liverpool Rd / Cavill Ave (Dev-PM)]

Network: N101 [Ashfield (Dev-PM)]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
East: Liverpool Rd - E														
2	T1	1400	5.0	1400	5.0	0.371	0.0	LOS A	5.1	36.9	0.00	0.00	0.00	59.9
Approach		1400	5.0	1400	5.0	0.371	0.0	NA	5.1	36.9	0.00	0.00	0.00	59.9
North: Cavill Ave - N														
4	L2	104	3.0	104	3.0	0.123	7.1	LOS A	0.2	1.5	0.49	0.65	0.49	43.3
Approach		104	3.0	104	3.0	0.123	7.1	LOS A	0.2	1.5	0.49	0.65	0.49	43.3
West: Liverpool Rd - W														
7	L2	33	3.0	33	3.0	0.263	2.8	LOS A	0.0	0.0	0.00	0.04	0.00	56.3
8	T1	959	5.0	959	5.0	0.263	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.4
Approach		992	4.9	992	4.9	0.263	0.1	NA	0.0	0.0	0.00	0.02	0.00	59.1
All Vehicles		2496	4.9	2496	4.9	0.371	0.3	NA	5.1	36.9	0.02	0.03	0.02	56.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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